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ABSTRACT

This report describes effective approaches for enhancing maternal, infant, and family outcomes based on the scientific and systematic assessment of the content of prenatal care conducted by the Public Health Service's Expert Panel on the Content of Prenatal Care. The range of risks, both medical and psychosocial, that the prenatal care provider must consider are reviewed, and the components and delivery of preconception and prenatal care are discussed. The time of delivery of the content of prenatal care is delineated in terms of a recommended series of medical visits from preconception through the 41st week of pregnancy. Prenatal care for at-risk women with medical or psychosocial risk factors is discussed. Also discussed are services in a psychosocial risk program, services to improve health-related behaviors, and services to improve psychological status and social support. A list of references is included with each chapter. Appendixes describe the panel's criteria for evaluating evidence on the effectiveness of prenatal interventions and list components in the content of prenatal care. (BC)

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Caring for Our Future: The Content of Prenatal Care

A Report of the Public Health Service Expert Panel on the Content of Prenatal Care

1989
Washington, DC

Public Health Service
Department of Health and Human Services

A Message From the Chairman of the Public Health Service Expert Panel on the Content of Prenatal Care

People are the assets of a society. Critical to every person is his or her health and, along with that health, the ability to work productively. A singularly important resource to our society is the newborn infant, if born with the capacity to function well in our world. In contrast, if born already deprived, unable to function with full equality as a newborn citizen, waste and harm comes to the individual and the community.

Prenatal care for the mother and her child has long been accepted as an important medical pathway to prevent harm. In the treatment and prevention of illness, by using medical advances such as the treatment of erythroblastosis, which now prevents fetal death and infant brain damage, or controlling glucose metabolism in bringing to the diabetic mother expectations of a healthy baby, prenatal care has made remarkable contributions.

And yet, there is a part of prenatal care that has always escaped our understanding. Even in the absence of disease, prenatal care appears to lead to healthier pregnancies. We often cannot explain why a mother who enters a prenatal health care system early in pregnancy appears to have improved pregnancy and newborn outcome, compared with a similar mother who receives little or no prenatal care. Prenatal care correlates well with the prevention of poor pregnancy outcome.

In November of 1986, I was asked to chair a "panel of experts" charged to better understand, explain, and define the content of prenatal care. What was there in prenatal care that was good and should be preserved? What was needed in prenatal care and should be instituted? And what parts of prenatal care were not useful or helpful and should be discarded?

The panelists, all of whom I offer now my strongest appreciation, and who are listed on page viii of this report, were drawn from many sectors of the health care system, balanced for knowledge in medical care, an understanding of study design and statistics, and knowledge in the broad social support areas so intrinsic to support the quality of an individual's life.

I note that, except for the goal of improving prenatal care, this was not a single-minded Panel. Special individual interests and special health care concerns were voiced, debated, at times argued, but ultimately voted on—often in consensus, but not always.

The amazing and humbling message, which became apparent to the panelists as this huge volume of information was being assessed, was how little we knew. It was clear that the timing of a first prenatal visit should be preconceptional. In contrast, the timing of few other prenatal visits could be supported by scientific information until perhaps the 41st week of gestation, which was again considered a most important visit. In the area of content of a visit, perhaps we could argue that obtaining a blood pressure was important in a pregnancy, or that obtaining a venereal disease screening test or a blood sugar was important at some point in a woman's health care. But when to obtain the test, or how often to take the blood pressure, or who should be screened for the risk was less clear.

And if the medical aspects lacked studies, the psychosocial aspects were even more in need of additional investigation. Surely counseling for cessation of smoking was a good health idea, but when was the counseling most effective? Surely the prevention of child and family abuse was important—but the data indicating that we could effectively intervene were less clear.

In this report on the content and timing of prenatal care, the Panel members present their best efforts. Many new concepts are suggested as part of prenatal care. These concepts include the acceptance of preconceptional screening as a normal part of women's health care, the alteration in the number of visits for

a healthy woman's visit schedule, and the change from the current medical model (i.e. the toxemia of pregnancy model) to an enhanced medical and psychosocial prenatal care program for the mother, her unborn infant, and her family with objectives extending through the first year of infant life.

I note with gratitude the unwavering support of the Public Health Service, especially the National Institute of Child Health and Human Development, as the Panel deliberated and redeliberated in trying to complete this report. I note that this charge was awesome in its extent and its implications for the patients we serve. I also know that to suggest change and to introduce new ideas invites both criticism and potential resistance. I expect this report will create a great deal of discussion.

I will leave the reader with this suggestion: "Don't throw this baby out with the bath water." If a test, a visit, or a program—finally accepted by the Panel in its best judgment—is not felt by you to be warranted, prove it with study. Do not arbitrarily discard the report and its recommendations. Much documentation and new study in prenatal care is needed. Look upon this report as the beginning of a process to improve prenatal care. Both the reader and the Panel should accept the concepts that prenatal care is important and must be more effective and efficient and that prenatal care must be made more accessible and must be extended to many more mothers and families.

For—and I repeat—if a society's assets are its citizens, then the need for infants to be born well is paramount.

Mortimer G. Rosen, M.D.
Chairman, Public Health Service
Expert Panel on the Content of
Prenatal Care

Foreword

In the United States, we are concerned about being tied for 17th ranking in the world in infant mortality (10.4 deaths per 1,000 live births in 1986) while spending a higher portion (11 percent in 1986) of our gross national product on health care than does any other country in the world. Further, the disparity between black and white infant mortality and low birthweight rates (roughly double) is a source of concern. Clearly, something is wrong with the way we provide care to women to prevent pregnancy complications and ensure the best possible infant outcome.

A number of reports have addressed the problem of infant mortality and its associated conditions in recent years. In all of them, prenatal care has emerged as the major factor in the prevention of infant mortality and morbidity. This report goes well beyond all others by examining in detail the components of prenatal care and the timing and frequency of their delivery.

This effort was initiated by the Department of Health and Human Services Low Birth Weight Prevention Work Group to provide the knowledge to ensure that prenatal care would be maximally effective in enabling a healthy pregnancy and outcome for all women in the United States.

The diligent work of the Public Health Service Expert Panel on the Content of Prenatal Care will benefit prenatal and specialized care providers, pregnant women and their families, and women contemplating pregnancy. As cochairs of the Department of Health and Human Services Low Birth Weight Prevention Work

Group, we welcome the availability of this valuable contribution to knowledge on prenatal care and urge that it be read widely by women, providers, and policymakers.

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Acknowledgments

This report has been a collaborative effort involving many individuals and groups who provided knowledge and hard work to accomplish the many complex tasks needed to produce the report. The Public Health Service Expert Panel on the Content of Prenatal Care, whose members are listed on page viii, worked with determination and sensitivity over a period of 3 years to accomplish a monumental and truly interdisciplinary effort. They were ably and tirelessly led by Dr. Mortimer Rosen. Their work benefited from the review and comments of the Department of Health and Human Services Low Birth Weight Prevention Work Group, whose members are listed on page ix.

In the early stages of report preparation, a number of background papers were prepared by members of the Panel and outside consultants. These papers provided the basis for much of the Panel's analysis and many of their recommendations. These papers (listed on pages x and xi) will be published separately: the publication will be available in late 1989 or early 1990.

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BACKGROUND PAPERS

Accurately Dating Pregnancy
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Alcohol Reduction Counseling
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Comprehensive Services for Pregnant Adolescents
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Criteria for Evaluating Evidence Regarding the Effectiveness of Prenatal Interventions
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Critical Issues in Diabetes and Pregnancy: Early Identification, Metabolic Control, and Prevention of Adverse Outcomes
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The Detection and Prevention of Preeclampsia
Perry A. Henderson, M.D.
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Direct and Indirect Effects on the Infant of Maternal Drug Abuse
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Exercise and Work During Pregnancy
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Family Violence
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Health Education Interventions During Pregnancy
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The History of Prenatal Care: Cultural, Social, and Medical Contexts
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Home Visiting
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Infectious Disease in the Prenatal Period and Recommendations for Screening
Richard J. Whitley, M.D.
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Intrauterine Growth Retardation
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Maternal Hematologic Status and Pregnancy Outcome
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Maternal Nutrition
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Maternal Stress, Anxiety, and Social Support During Pregnancy: Possible Directions for Prenatal Intervention
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Postterm Pregnancy
Harold E. Fox, M.D.

Preconception and Postconception Care of Women with Medical Illness
Ellen A. Harrison, M.D.

Preconception Care
Brian Jack, M.D.
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Prenatal Care and Its Components: The Effect on Preterm Birth and Low Birthweight
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Prenatal Care Providers
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Prenatal Diagnosis and Treatment of Genetic Disorders
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Psychosocial Factors in the Transition to Parenthood
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Screening for Isoimmunization
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Individuals who assisted in preparation of the background papers were Barbara J. Reale, C.N.M., M.S.N., of the University of Pennsylvania School of Nursing; Lisa Paine, C.N.M., M.S., M.P.H., of The Johns Hopkins University; and Margaret Comerford Freda, R.N., Ed.D., of the Albert Einstein College of Medicine.

During the early stages of report development, the Panel received invaluable assistance from Ms. Felicity Skidmore, Writing Consultant, who developed the basic structure and initial wording of the report.

Finally, the staffs of the National Institute of Child Health and Human Development and the Bureau of Maternal and Child Health and Resources Development provided expertise and support to the Panel's efforts. The Executive Secretary of the Panel was Mr. James G. Hill, National Institute of Child Health and Human Development. He was assisted by Dr. Woodie Kessel and Dr. Ann Koontz of the Bureau of Maternal and Child Health and Resources Development.

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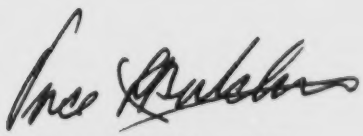

Vince Hutchins, M.D.

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1

Highlights of the Report and Process Used by the Panel

In this century, the health care service most relied upon to assure positive pregnancy outcomes has been prenatal care (Thompson et al. 1990). In general, women who receive prenatal care during the first trimester have better pregnancy outcomes than women who have little or no prenatal care (National Center for Health Statistics 1988). Major improvements in the quality of life have resulted from the use of the present prenatal care system, and the birth of an infant is an important and happy event in most families. The Panel reaffirms that prenatal care provides a foundation for improving the health of the pregnant woman, infant, and family, and that the prenatal care system is a cornerstone of health care delivery in our society.

Although rates of maternal mortality and morbidity declined dramatically over the last 30 years, and rates of infant mortality declined steadily though less dramatically, by the mid-1980s it became clear to health professionals and the general public that additional efforts were needed if pregnant women and infants in the United States were to receive the full benefits of what was currently known about health during pregnancy and in the first year of life (National Center for Health Statistics 1988).

HIGHLIGHTS OF THE REPORT

Enriching prenatal care and placing more emphasis on preconception and early pregnancy is the intended message of this report. What follows are the highlights of the changes in prenatal care most needed to accomplish this. These changes reflect advances in knowledge and understanding of the biology of pregnancy and of psychological and social influences. They

also reflect advances in clinical obstetrics and a basic belief that prevention is preferable to treatment. These changes will involve alterations in attitudes of health care professionals and new approaches to the delivery of prenatal care.

The broad objectives of prenatal care are to promote the health and well-being of the pregnant woman, the fetus, the infant, and the family up to 1 year after the infant's birth. The prenatal period provides an opportunity to look beyond pregnancy and delivery to identify the resources essential for further healthy development of parents and infant. The objectives of prenatal care are concerned with more than the prevention of maternal and neonatal morbidity and mortality; these objectives include other aspects of the woman's health prior to, during, and after pregnancy and include the promotion of healthy child development, positive family relationships, and family planning.

For prenatal care to be effective, it must be available and it must be used. Every woman of reproductive age in the United States should participate in a basic program of prenatal health care and family planning—care that is augmented according to her needs and risk status. In planning, using, and evaluating prenatal care and services, the active participation of a woman and her support persons is essential; professionals can meet the prenatal care objectives only with their cooperation and partnership.

The three basic components of prenatal care are (1) early and continuing risk assessment, (2) health promotion, and (3) medical and psychosocial interventions and followup. Risk assessment includes a complete history, a physical examination, laboratory tests, and assessment of fetal growth and well-being. Health promotion consists of counseling to promote and support healthful behaviors, general knowledge of pregnancy and parenting, and information on proposed care. Interventions include treatment of existing illness, modifications of behavior, provision of social and financial resources, and referral to and consultation with other specialized providers.

To ensure the health of the woman and the developing fetus, preconception care should be an integral part of prenatal care. Many of the medical conditions, personal behaviors, and environmental hazards associated with the negative outcomes of pregnancy can be identified and should be modified or treated prior to conception. Care begun before pregnancy has great potential to assure health and ameliorate disease conditions for

women. Such care would also avoid possible negative effects on the fetus of maternal treatment. The three components of prenatal care should begin prior to pregnancy in a preconception visit and should continue during prenatal visits, educational sessions, and other contacts with prenatal care providers. Pregnancy is often the impetus for a woman to seek health care following a period of either no care or episodic care. Every woman (and, when possible, her partner) contemplating pregnancy within 1 year should consult a prenatal care provider. Because many pregnancies are not planned, providers should include preconception counseling, when appropriate, in contacts with women and men of reproductive age.

Prenatal care should add to the traditional medical concerns a new emphasis on the psychosocial dimensions of that care, maintaining a balance among all factors. During the latter half of the 20th century, the approach to prenatal care has been a continuation of a medical model based primarily on the detection and treatment of preeclampsia and, more recently, the prevention of preterm birth. The content of prenatal care should include all necessary psychological, social, educational, and general medical assessments and interventions. Comprehensive prenatal care such as this has considerable potential for improving the health of the woman, infant, and family. Medical, psychological, and social risks often interact with each other and consequently require a multidisciplinary strategy for success.

Because significant change in risk status can arise at any time during pregnancy, continuing risk assessment throughout pregnancy is necessary for all women. Pregnancy is considered to be a healthy, normal state for most women, and a large number of women are healthy during pregnancy. Yet not all women remain so throughout pregnancy or begin pregnancy free of risk, because of preexisting medical, psychological, or social conditions. Those women who have increased risk of adverse pregnancy outcome can, to a considerable extent, be identified either before pregnancy begins or early in pregnancy, enabling treatment to be initiated early to minimize adverse outcome.

The specific content and timing of prenatal visits, contacts, and education should vary depending on the risk status of the pregnant woman and her fetus. For women considered to be healthy, visits with prenatal care providers should be scheduled for specific risk assessment or planned health promotion. The information obtained from continuing risk assessment will determine the content and frequency of prenatal care. When possible, risk assessment and health promotion should be

integrated into a single visit to minimize inconvenience for the pregnant woman for whom transportation or child care may be a problem. To minimize stress while adequately addressing women's pregnancy care needs, the timing of prenatal visits should be flexible and the information provided should be substantive. One prenatal care provider should be in charge of and coordinate the team providing each woman's prenatal care.

A comprehensive prenatal care record facilitates continuous documentation of all risk assessment, health promotion, and intervention activities, including those done preconceptionally, as well as facilitating information transfer for intrapartum care. As risk assessment changes the content of prenatal care in the attempt to reach prenatal care objectives, the prenatal record serves as a vehicle of communication among the health care team members and institutions as well as among the patient and her care providers. It functions as an instrument for evaluating and enhancing the quality of care. A universal prenatal care record will promote continuity of care and allow comparable analyses from diverse settings and populations.

The effectiveness of prenatal care will be improved by additional research on the specific content of prenatal care. As in other health care systems, many prenatal care practices have not been studied. Further, many practices that have been studied were not evaluated rigorously or with an adequate research design. Finally, new patient-care practices will need evaluation as clinicians, families, and health policy personnel seek to attain the broad objectives of prenatal care.

OBJECTIVES OF PRENATAL CARE

In the past, prenatal care focused on the prevention of eclampsia and other maternal correlations of toxemia. In recent years, prenatal care has become more concerned with the identification and management of high-risk conditions for the fetus and newborn. A broader, contemporary view of prenatal care, however, sees pregnancy as an opportunity to promote the health and well-being of the family. In addition to assuring the health of the pregnant woman and the birth of a healthy infant, the objectives of prenatal care apply to the family during the pregnancy and the infant's first year of life.

The objectives of prenatal care for *the pregnant woman* are

- to increase her well-being before, during, and after pregnancy and to improve her self-image and self-care;
- to reduce maternal mortality and morbidity, fetal loss, and unnecessary pregnancy interventions;
- to reduce the risks to her health prior to subsequent pregnancies and beyond childbearing years; and
- to promote the development of parenting skills.

The objectives of prenatal care for *the fetus and the infant* are

- to increase well-being;
- to reduce preterm birth, intrauterine growth retardation, congenital anomalies, and failure to thrive;
- to promote healthy growth and development, immunization, and health supervision;
- to reduce neurologic, developmental, and other morbidities; and
- to reduce child abuse and neglect, injuries, preventable acute and chronic illness, and the need for extended hospitalization after birth.

The objectives of prenatal care for *the family* during pregnancy and the first year of the infant's life are

- to promote family development, and positive parent–infant interaction;
- to reduce unintended pregnancies; and
- to identify for treatment behavior disorders leading to child neglect and family violence.

ORIGIN OF THE PANEL

The process used to arrive at the preceding highlights and the specific recommendations that follow from them respond to the charge given the Expert Panel on the Content of Prenatal Care. The charge was based on the assumption that the birth of a healthy infant to a healthy woman is a most important goal for our nation.

Prenatal care has been defined and practiced in a variety of ways but has usually focused on the provider's assessing medical risks and providing therapeutic interventions. Because the current structure of prenatal care evolved chiefly in response to the problem of maternal toxemia, the timing of visits has been heavily weighted toward the third trimester.

By the mid-1980s, health professionals, policymakers, and the general public agreed that adequate prenatal care was essential for all women and additional efforts to understand the nature of the content of prenatal care were necessary if pregnant women, their infants, and their families were to receive full benefits of health care during pregnancy and the first year of life. However, the mechanisms through which specific components of prenatal care contribute to improved pregnancy outcomes were not well understood (Institute of Medicine 1985; Office of Technology Assessment 1988; Institute of Medicine 1988).

In 1986, the Department of Health and Human Services Low Birth Weight Prevention Work Group assembled a panel of 19 national experts from many disciplines: consumer affairs, economics, epidemiology, family practice, health education, health services research, law, neonatology, nurse-midwifery, nursing, nutrition, obstetrics, pediatrics, psychiatry, public health, and social work, and instructed it to examine the content of prenatal care and its effectiveness in promoting the health and well-being of women and their infants. This report presents the Panel's findings on the content of prenatal care.

THE CHARGE TO THE PANEL

The charge to the Expert Panel on the Content of Prenatal Care was to assess the content of prenatal care scientifically and systematically and report on effective and efficient approaches for enhancing maternal, infant, and family outcomes. Specifically, the Panel was to review the current content of prenatal care, review the scientific evidence upon which the current practices were based, and consider implications of new research findings from multiple domains. The Panel was to distinguish between practices that had or had not been evaluated, did or did not need additional study, and should or should not be provided; finally, the Panel was to recommend additional studies where necessary.

The Panel approached its task in the following manner. It (1) defined prenatal care and related terms; (2) specified the

objectives of prenatal care; (3) identified the basic components and the content of prenatal care; (4) established criteria to assess the effectiveness of the components of prenatal care; and (5) formulated recommendations based on a review of the scientific evidence.

CONTENT OF PRENATAL CARE

In keeping with the broad view of prenatal care, the Panel began its work by developing a comprehensive list of the specific contents of prenatal care (appendix B). This list includes content that assists in preparing for a pregnancy, birth, and parenting, as well as traditional content for risk assessment, early diagnosis, and medical and psychosocial interventions. The list was developed from review of the literature, professional clinical standards, and the clinical expertise of Panel members and selected consultants. At times the description of a condition and a treatment for the condition overlapped, particularly in the area of psychosocial interventions. Medical issues were limited to the identification of risks; treatment of disease during pregnancy was not the Panel's charge.

SCIENTIFIC EVIDENCE AND PRENATAL CARE

The Panel examined two broad categories of prenatal care activities: medical and psychosocial. This was accomplished through a careful review of the literature and through preparation of background papers. The background papers upon which portions of the Panel's report are based will be published separately. The literature examined contained limited analyses of the relationships between a specific activity (content) and a specific outcome. The Panel noted the difficulty of finding studies that related content of prenatal care to the broad objectives. As a subset of the broad objectives put forth in this report, pregnancy outcomes receive more attention in the discussion because these were primarily what was available for study.

Panel members and consultants reviewed prenatal care activities designed to prevent a condition or, by early diagnosis, to intervene early enough in a condition to improve outcome. The focus was on activities that identified a specific risk factor known to compromise the outcomes of pregnancy (e.g. smoking) and specific health promotion activities or interventions (e.g.

smoking cessation) known to improve the woman's chances of attaining the broad objectives of prenatal care. Therapy was not reviewed, as treatment of medical illness is well described elsewhere, and was not part of the charge to the Panel.

Major obstetric conditions reviewed included Rh isoimmunization, pregnancy-induced hypertension, eclampsia, preterm labor, and intrauterine growth retardation. Medical diseases and conditions reviewed included infections, hereditary conditions, and diabetes and other chronic illnesses. Nutritional deficiencies and dietary supplementation were also part of the medical–obstetric literature review.

Psychosocial content, including health promotion for prevention and intervention, surveyed such areas as maternal stress and anxiety, self-esteem, education for self-help, supportive programs such as home visits and financial support, unintended pregnancy, preparation for childbirth and parenting, and interventions designed to change unhealthy personal habits such as smoking, consuming alcohol, and abusing drugs. Counseling and methods to decrease family violence were also reviewed. The review also included studies on work hazards and toxic exposures.

After review of existing methodological criteria such as the Surgeon General's criteria and Canadian criteria, the Panel established its own criteria for evaluating the scientific evidence related to the specific contents of prenatal care.* The evaluation of each activity followed a three-step process.

1. Studies of each activity were categorized by research design, e.g. randomized controlled clinical trials, cohort or case-control studies, and time-series studies.

2. Evidence for a relationship between the activity and a prenatal care objective was evaluated using factors such as temporal relationship, biological plausibility, consistency, dose–response relationship, strength of association, cessation effect, and the degree of control for confounding.

3. Quality and strength of the evidence was evaluated as good, fair, or poor. In addition, the rating of the activity was reviewed to determine whether the care was indicated for all pregnant women or for only some.

*Appendix A contains the full description of the criteria and how they were applied.

DEVELOPMENT OF RECOMMENDATIONS

Recommendations consistent with the evidence were then discussed by the Panel. In some cases, when the evidence in the research literature was lacking or so inadequate that the criteria could not be applied, a recommendation was made based on the clinical judgment of the Panel members. The bases for inclusion are reflected in the list of recommendations in the following chapters. Issues of cost, patient acceptability, risk-benefit ratio, and feasibility were also considered and are noted where appropriate.

The recommended content of prenatal care is presented in chapters 3 through 6. The evidence supporting a recommendation on content sometimes also suggested its frequency and timing in the sequence of prenatal care; in most cases, however, evidence supporting specific frequency and timing was lacking. In these instances, the Panel again based the suggested frequency and timing on the judgment of Panel members, who considered the temporal relationship of the activity to the pathologic sequence to be prevented, interrupted, or modified.

GLOSSARY

This glossary of terms reflects the meanings given these words by the Panel: it should be understood that the Panel's definitions may not agree with similar terms appearing elsewhere.

Content of Prenatal Care—consists of activities carried out by prenatal care providers, women, families, and specialized providers to promote health, assess risk status, and intervene in a timely manner so that the broad objectives of prenatal care are achieved.

Health Promotion—consists of education and counseling activities to maintain and enhance health, support healthful behaviors, increase knowledge about pregnancy, birth, and parenting, and encourage the woman and her family to participate in the decisions needed during prenatal care. Educational activities include individual counseling and group sessions, as well as informal interactions among the woman, her family, and the health care team members.

Intervention to Reduce Risk—includes medical treatment of identified illnesses or disease, substance abuse counseling and treatment programs, referral to programs for nutritional supplementation, a program of home visits, and a broad range of referrals to specialized providers and programs.

Medical Risk—includes physiological, nutritional, obstetrical, or genetic factors that may affect a woman's ability to achieve prenatal care objectives. Medical and psychosocial risks are difficult to separate. One may overlap, accompany, or follow the other.

Preconception Care—consists of in-person visits prior to conception between a woman and a health professional to review the health status of the woman and her partner. Preconception care includes risk assessment, diagnosis, and treatment, as well as health promotion that includes counseling on health practices that should lead to the optimal achievement of prenatal care objectives.

Prenatal Care—consists of health promotion, risk assessment, and intervention linked to the risks and conditions uncovered. These activities require the cooperative and coordinated efforts of the woman, her family, her prenatal care providers, and other specialized providers. Prenatal care begins when conception is first considered and continues until labor begins. The objectives of prenatal care for the mother, infant, and family relate to outcomes through the first year following birth.

Prenatal Care Providers—are health professionals who offer primary, secondary, and tertiary care for pregnant women, including support for their families. Prenatal care providers include obstetricians, certified nurse-midwives, family physicians, nurse practitioners, physician assistants, and community health nurses. Despite the fact that several specialized providers may be involved in one woman's care, one prenatal care provider shall have responsibility for her care and assure coordinated, comprehensive, quality services.

Prenatal Contacts—are interactions other than prenatal visits between the pregnant woman and her prenatal care provider or other specialized providers. These contacts may be by telephone or in person and might include such activities as social service assessment, communication of laboratory results, group education, or nutritional consultation.

Prenatal Visits—are in-person contacts between the pregnant woman and a prenatal care provider. These visits usually take place in the practice setting of the care provider, but may take place in the woman's home, at school, in the hospital, or at other sites.

Psychosocial Risk—includes psychological, social, environmental, or behavioral factors and personal habits that may diminish a woman's ability to achieve prenatal care objectives. Again, medical and psychosocial risks are difficult to separate and may overlap, accompany, or follow one another.

Risk Assessment—consists of activities that confirm the presence or absence of medical and psychosocial risks prior to and throughout pregnancy. The categories of risk assessment include (1) history, (2) physical examination, and (3) laboratory tests.

Specialized Providers—are health care professionals and others who offer specific services in support of prenatal care. Examples of this group include consulting physicians, clinical nurse specialists, social workers, nutritionists, psychologists, health educators, and community health workers.

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2

Risk Assessment

This chapter will describe risk assessment and review the range of risks that the prenatal care provider must consider. A well-documented comprehensive risk assessment should enable the prenatal care provider to determine whether the woman, the fetus or infant, or the family are at increased risk of failing to achieve the objectives of prenatal care and should provide the basis for intervention. The major parts of such a risk assessment are a comprehensive history, a thorough physical examination, and laboratory tests. These risk assessment activities should begin during the preconception period and continue until the onset of labor and delivery. These activities will assist the provider in determining if a pregnant woman (or a woman in her reproductive years who is not pregnant—preconception care) is, at the time of assessment, (1) at no apparent risk; (2) at apparent risk due to medical factors; (3) at apparent risk due to psychosocial factors; or (4) at apparent risk due to both medical and psychosocial factors.

Risk assessment is a dynamic process that includes the concepts of relative risk and attributable risk.* Many women will change risk status during pregnancy; successful intervention may also change risk status. The content, timing, and number of prenatal care visits will vary according to the woman's current risk status. Those at risk will require more prenatal care visits with specialized content. Some women at psychosocial or medical risk may find additional visits stressful. For these women,

*Relative risk is a measure of the potential of an adverse outcome in women with the risk factor compared to the adverse outcome in women without the risk factor. Attributable risk is a measure of the potential reduction in adverse outcome that can be achieved by reducing the frequency of the risk factor in a population of women.

services at home or at other sites may be needed, and public health or visiting nurses, caseworkers, social workers, outreach staff, and homemakers may provide the appropriate care.

The risk profile of the woman may change between the preconception period and pregnancy or during the pregnancy itself. For this reason, risk assessment is a continuing process, and the provider must change the content of prenatal care and the timing and frequency of visits, as changes in risk status become apparent. Further, prenatal care providers should be fully informed of the assessment and management of medical or psychosocial risks identified by other members of the health care team. An organized record-keeping system will assist in this information exchange.

The association between medical or psychosocial risks and maternal and infant mortality and morbidity is not necessarily direct. Moreover, medical risks may lead to psychosocial problems; for example, the prescription of strict bedrest for premature labor may place additional responsibilities on other family members, potentially resulting in psychosocial stress. Psychosocial risks may themselves have medical consequences. The pregnant woman exposed to many social stresses may deliver preterm. The adolescent unprepared for parenting during prenatal care may later neglect her infant.

The distinction between medical and psychosocial risk factors is not always clear. The age of the mother is an example of a characteristic that is associated with both medical risk (because pregnancy at the extremes of the reproductive age span can have specific physiological consequences) and psychosocial risk (because women in different social strata differ in the likelihood of reproducing at different ages). The distinction made in this report between these two broad categories is pragmatically based on the different nature of the responses the health care system uses to deal with medical risk or with psychosocial risk.

Risk factors are simply characteristics that have been shown to be associated with one or more adverse reproductive outcomes. Risk factors need not be direct antecedents or causes of disease. They are markers of elevated risk, that is, they are associated with increased risk only because they serve to identify women who experience a higher-than-average proportion of adverse outcomes. The advantage in identifying these women is that resources can be assigned more effectively, although it is understood that adverse outcome is not limited to this group, nor do all in this group have adverse outcomes. For example,

women who do not complete high school are at higher risk for having low-birthweight babies. It would be a mistake to conclude, however, that exposure to the content of high school courses promotes fetal growth. One reason for this finding may be that women who have not completed high school are more likely to smoke. Schooling is not very directly related to smoking, and yet the two variables are sufficiently related in the population at large that less schooling serves as a crude but measurable marker for the risk that occurs with smoking during pregnancy.

MEDICAL RISK FACTORS

The medical variables that are associated with adverse pregnancy outcome can be categorized as follows: (1) genetic factors, (2) nutrition and anthropometric characteristics, (3) medical disorders prior to pregnancy, (4) reproductive history, and (5) specific pregnancy conditions or hazards. Brief descriptions of each of these variables that can affect pregnancy outcome are presented below. Although the variables are reviewed further in chapter 6, neither discussion is meant to be complete. The material here and that in chapter 6 are derived from the background papers, which will be published separately.

Genetic Factors

Chromosomal abnormalities are a major cause of both reproductive loss and childhood handicap. Most known recessive-gene conditions tend to cause abnormalities after birth, but many can be detected *in utero*. Examples of disorders that can be detected *in utero* include Tay-Sachs disease, the Duchenne form of muscular dystrophy, beta thalassemia, and Down syndrome. Risk factors for the presence of genetic disorders include ethnicity, family history, and advanced maternal age (Hogge 1990[a]).

Nutrition and Anthropometric Characteristics

Low maternal prepregnant weight-for-height is linked to risk of low birthweight. These characteristics have usually been interpreted to reflect the long-term nutritional state of the mother. Weight gain in pregnancy is also linked to infant birthweight (Anderson et al. 1984).

Studies of birthweight under famine conditions have conclusively demonstrated that fetal growth is severely compromised when maternal caloric intake drops below 1,500 calories per day in the third trimester (Hemminki and Starfield 1978). Whether fetal growth is affected under less stringent conditions is uncertain. Vitamin supplementation has not been shown to be effective. Research currently under way may provide definitive information on the effectiveness of supplementation. A thorough review of the data related to nutrition during pregnancy can be found in the publication *Nutrition during pregnancy: Weight gain and nutrient supplementation* (Institute of Medicine, in press).

Medical Disorders Prior to Pregnancy

Any medical disorder can complicate pregnancy. Among the most common conditions are hypertension, diabetes, anemia, and psychiatric disorders. The background paper, *Preconception and postconception care of women with medical illness,* discusses many of the disorders which must be screened for and treated (Harrison 1990).

Reproductive History

The single best predictor of preterm birth is a history of prior preterm delivery (Hoffman and Bakketeig 1984). Furthermore, reproductive difficulties tend to cluster in the same women, and any prior adverse outcome (e.g. spontaneous abortion, late fetal death, intrauterine growth retardation) is associated with an increased risk of the same event and related untoward events in subsequent pregnancies (Bakketeig et al. 1979). Prior induced abortion by itself does not increase the risk of prematurity unless procedures damaging to the cervix were used or the number of abortions was large.

The lowest perinatal mortality is consistently found in the second pregnancy, although the difference is small for women of parities fewer than five. Pregnancy before the age of 15 and after the age of 40 may carry increased biologic hazard as well as psychosocial consequences, although most of these women are still successful in achieving a healthy pregnancy. An unusually short interpregnancy interval may not allow for adequate time to replace maternal nutrients and may compromise health during pregnancy (Centers for Disease Control 1986).

Specific Pregnancy Conditions or Hazards

The risk of development of preeclampsia in the third trimester was a major impetus for the development of current systems of prenatal care. Low socioeconomic status, primiparity, twin pregnancy, and, possibly, maternal age are known risk factors for this important disorder. This disease condition, like all others, can, if untreated, cause serious morbidity and mortality in both mothers and babies (Sibai et al. 1984; Henderson and Little 1990).

Diabetes mellitus may predate pregnancy or arise *de novo* due to changes associated with the physiology of pregnancy. The latter form usually disappears after delivery (gestational diabetes) but its presence in pregnancy increases fetal risk, the likelihood of complicated deliveries, and newborn problems, when undiagnosed (Coustan and Imrah 1984; Langer 1990).

Blood group incompatibilities are also major causes of fetal demise and infant illness. The virtual elimination of rhesus hemolytic disease (Rh incompatibility) through prevention (RhoGAM) and treatment (phototherapy and exchange transfusion) has been an important triumph of modern medicine and illustrates the value of risk assessment, perinatal care systems, and research (Scott 1982; Poland and Tucker 1990).

Women with multiple gestations usually deliver earlier than women carrying singletons, and their infants are often lower weight. As a consequence, the risk of infant mortality is increased five- to tenfold in twin pregnancies and rises even higher when more than two fetuses share the uterus (Hayes and Smeltzer 1986).

Maternal phenylketonuria and sickle cell anemia are two of the many single-gene disorders that can severely complicate pregnancy. Conditions that affect the shape of the pelvis (e.g. severe rickets) or the function of the reproductive organs (e.g. bifid uterus) are by their nature severe threats to favorable pregnancy outcome (Jones and Wheeless 1969).

Malposition, early separation, and structural abnormalities of the placenta are significant causes of poor pregnancy outcome. The position and size of the fetus are major determinants of the ease or difficulty of delivery. The condition of the cervix may be a determinant of preterm delivery. Whether surgical treatment of "incompetent cervix" prevents early delivery is unclear, possibly because surgical treatment has been overutilized. More precise risk criteria are needed to determine appropriate candidates for

surgery. Abnormal amounts of amniotic fluid can indicate an abnormal fetus and can further complicate pregnancy and delivery (Hobbins et al. 1979).

A wide variety of infections during pregnancy can affect maternal and infant health. Rubella is a well-known teratogenic virus. Adverse effects also are seen with agents as diverse as cytomegalovirus (CMV), toxoplasmosis, human immunodeficiency virus (HIV), syphilis, herpes, chickenpox, and hepatitis. Listeria monocytogenes, gonorrhea, streptococcus group B, and tuberculosis are other sources of infections in pregnancy. These infections illustrate the need for preconception screening, selective counseling, and treatment or immunization as strategies in reducing risk both to the mother and fetus (Sweet et al. 1987; Whitley and Goldenberg 1990). The role of infectious agents in causing preterm delivery has long been suspected. (Maternal urinary infection in pregnancy was one of the earliest suspects.) Nonetheless, studies of putative infectious agents of prematurity (e.g. ureaplasma, mycoplasma, chlamydia trachomatis) are, so far, inconclusive.

To list every known toxic or teratogenic agent (whether an over-the-counter drug, a prescription drug, a household product, or a workplace agent) that might be ingested by pregnant women would be beyond the scope of this report. Among the best documented teratogenic drugs are thalidomide, antiepileptic agents, antineoplastic agents, and tetracycline (after the 4th month). Alcohol, tobacco, cocaine and other illicit drugs, and industrial byproducts (e.g. methylmercury, lead) are likewise hazards to a healthy pregnancy (Briggs et al. 1986; Hogge 1990[b]).

PSYCHOSOCIAL RISK FACTORS

The standard medical measurements obtained in most prenatal care providers' offices (e.g. blood pressure, urinalysis, hemoglobin) explain only a small portion of the variability in pregnancy outcomes. Descriptors of the mother's socioeconomic situation, however, are significant predictors of pregnancy outcome and of the health and well-being of the infant and family later in life (Hardy et al. 1979). This observation is true not only for outcomes that are commonly viewed as being linked to social and economic disadvantage, but also for conventional medical outcomes such as preterm delivery, intrauterine growth retardation, and infant mortality (Rush and Cassano 1983). Being a single parent, having few years of formal education, or

living in poverty are all associated with a substantially greater risk of infant death (Shapiro et al. 1980).

The term "psychosocial risk" comprises diverse variables, including low socioeconomic status, psychological factors, and adverse health habits. Demographic risk, encompassing factors such as age at reproduction, parity, and interpregnancy interval, has been included in the medical category described previously, but is also related to psychosocial risk. Psychosocial risk is discussed extensively in chapter 6 as well.

Socioeconomic Status

Socioeconomic status is an important variable related to psychosocial risk and is composed of a variety of factors, not all of which are strictly economic. Rankings of occupations, for example, incorporate elements of prestige: thus, the occupational rankings used by both the U.S. Bureau of the Census and the Office of the Registrar General in Great Britain place professional and technical workers above the frequently economically better-off business managers. Educational level is a common central measure of socioeconomic status, especially in the United States. Hollingshead's well-known index of "social position" combines both educational and occupational criteria.

In studies of reproductive outcome, educational level of the mother has primarily been used as the indicator of socioeconomic status. This is partly owing to the general absence of data on income, and also because occupation has been a poor guide to socioeconomic status in women. A broader overview of socioeconomic status would incorporate information on housing, income, education, work, marital status, nutritional resources, and other factors. However measured, low socioeconomic status is associated with poorer pregnancy outcomes, especially preterm birth, low birthweight, and infant mortality.

Psychological Factors

Psychosocial risk also derives from psychological problems such as a limited maternal support network, a high level of stress, emotional disorders, and ambivalence about the pregnancy itself. Although this area is critical for understanding pregnancy outcomes and for achieving the objectives of prenatal care, psychological factors have received little research attention. Understanding the relationship of stress to pregnancy has been

hindered by the lack of an agreed-upon definition of stress and the lack of simple biological markers of its presence.

Adverse Health Behaviors

Illicit drug use is extremely hazardous. The specific consequences of drug abuse depend on the kind of drug abused and how it is used (e.g. intravenous versus oral, multiple versus single drugs, frequency, addictiveness, etc.). Cocaine abuse (e.g. intravenous or smoking of crack) during pregnancy is associated with preterm labor, perinatal complications, low birthweight, and congenital cardiac anomalies, as well as maternal and fetal death (Little et al. 1989). Similarly, opiate and other psychoactive drug use during pregnancy has serious consequences for the mother and fetus, including poor parenting, and may lead to the birth of an addicted infant (Chasnoff 1988).

Among behaviors capable of having adverse effects on pregnancy, smoking has been best studied. Smoking affects intrauterine growth and, although to a lesser extent, preterm delivery, perinatal mortality, and obstetric complications such as abruptio placenta and placenta previa. Smoking-attributable infant mortality risk was found to be 25 and 56 percent greater among primiparas who smoked less than one pack and primiparas who smoked one pack or more, respectively. In multiparas, the excess risk was 30 percent (Kleinman et al. 1988).

Alcoholism in the mother has been linked to a specific constellation of physical and developmental abnormalities in the fetus, known as the Fetal Alcohol Syndrome. There is concern that minimal to moderate alcohol intake harms the fetus; level of use and related effects are still being studied.

SUMMARY

1. Although pregnancy is a healthy state, all women benefit from continuing risk assessment throughout pregnancy because their risk status may change.

2. Risk assessment is a process for identification of medical or psychosocial factors that place the woman at risk for not achieving the objectives of prenatal care.

3. Risk factors that antedate a pregnancy should be identified and treated prior to pregnancy, in a preconception visit.

4. Risk factors related to illness may be identified for the first time during a pregnancy or may arise because of the pregnancy.

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3

Preconception Care

INTRODUCTION

Health in pregnancy depends greatly on a woman's general health before the pregnancy. Personal habits, nutrition, medical conditions, and environmental considerations contribute to the woman's general health. All too often, health care options are limited by the time a woman is pregnant; clearly, the first pregnancy visit is too late to prepare for pregnancy. The purpose of preconception care is to ensure that a woman is healthy prior to pregnancy.

Because healthy women are more likely to have healthy babies, assuring good health prior to conception simply makes good sense and should be standard care. Diagnosis and interventions to treat medical illness and psychosocial risks prior to conception will eliminate or reduce hazards to the mother and baby. Care is also likely to be more effective prior to conception because evaluation and treatment can be initiated without harm to the fetus. For example, preexisting illness such as diabetes or hypertension should be adequately treated or controlled (Chamberlain and Lumley 1986; Fuhrmann et al. 1983; Fuhrmann et al. 1984) and behavior such as smoking, drinking, or using illicit drugs should be modified or eliminated prior to pregnancy onset (Warren and Bast 1988; Chasnoff 1988; Harlap and Shiono 1980; MacArthur and Knox 1988).

Preconception identification of women with any kind of medical illness or unhealthy behavior provides the opportunity for appropriate treatment, pregnancy planning, early entry into prenatal care, or recommendations for avoidance of pregnancy

(Jack and Culpepper 1990). The Panel recommends that the concept of preconception care be introduced as part of prenatal care with accompanying reimbursement and coverage included in all health insurance plans.

The preconception visit may be the single most important health care visit when viewed in the context of its effect on pregnancy. Family planning contacts provide a particularly appropriate time for preconception care. Logically, the last family planning visit should be the preconception visit.

COMPONENTS OF PRECONCEPTION CARE

The idea of preconception identification and reduction of reproductive risks has emerged, based on experience developed from screening, risk assessment, and health promotion programs. Few studies of the effects of preconception care in healthy populations have been reported, but studies are in progress. All women who can become pregnant and who present for continuing care in primary care settings, family planning clinics, and other women's health care settings are candidates for preconception care.

The ability of preconception activities to contribute to reaching the objectives of prenatal care will depend upon the recognition of risks, the availability of effective interventions, and the acceptance by the woman and family of those interventions. Consequently, the components of preconception care parallel the components of prenatal care: (1) risk assessment, (2) health promotion, and (3) intervention and followup. A more extensive discussion of preconception care is contained in a background paper that will be part of a separate publication.

Risk Assessment

Preconception risk assessment facilitates the planning, spacing, and timing of pregnancy. Awareness of illnesses or conditions such as diabetes or poor nutrition, which should be well controlled prior to pregnancy (Fuhrmann et al. 1983; Fuhrmann et al. 1984), or phenylketonuria, which requires diet modification (Lenke and Levy 1982; Drogari et al. 1987; Waisbren et al. 1988), would be beneficial in planning pregnancy. Counseling concerning human immunodeficiency virus (HIV) is important prior

to pregnancy (Centers for Disease Control 1987a; Centers for Disease Control 1987b).

Psychosocial risk factors may be altered prior to pregnancy if the preconception evaluation discloses a risk. With the knowledge gained from preconception risk assessment and with the use of medical and psychosocial interventions, treatment may be undertaken and pregnancy may take place or be deferred.

In addition to providing a baseline assessment of the woman's health, preconception risk assessment provides a unique opportunity to identify

- individual and social conditions, e.g. extreme obesity; advanced maternal age; special diets; and vocational, housing, and economic status;
- adverse health behaviors, e.g. use of tobacco, alcohol, and illicit drugs;
- medical conditions, e.g. immunity status, medications taken, genetic status, acute and chronic illnesses;
- psychological conditions, e.g. stress, anxiety, and depression;
- environmental conditions, e.g. workplace hazards, toxic chemicals, radiation; and
- barriers to family planning or early prenatal care enrollment.

Health Promotion

Preconception health promotion offers the opportunity to provide

- counseling about safer sex, pregnancy planning, spacing, and contraception;
- counseling about the availability of social programs, including vocational training, which might be considered as an alternative to pregnancy;
- advice regarding over-the-counter medications; and
- information on environmental hazards.

Intervention to Reduce Medical and Psychosocial Risk

The preconception visit provides an opportunity to intervene in medical or psychosocial risk identified by risk assessment. Such intervention includes

- treatment of disease identified, including infections;
- modification of chronic disease medication and regimens to decrease teratogenic risk;
- vaccination;
- counseling regarding behaviors, including those related to HIV and other infections;
- nutrition counseling, supplementation, or referral;
- substance abuse counseling or referral to treatment programs;
- home visiting to treat psychosocial risks;
- provision of social services and financial assistance;
- referral to other health care providers, e.g. community mental health center; and
- provision of contraception or referral for family planning.

PRECONCEPTION CARE DELIVERY

Elements of preconception care have been delivered in primary care settings by obstetricians, nurse-midwives, family physicians, internists, and pediatricians in the case of the adolescent; in family planning clinics; and in high-risk prepregnancy clinics. Some preconception risk-reduction activities have been practiced for many years: general counseling, rubella and syphilis testing, and genetic screening and counseling. Over the last two decades, an increasing variety of programs that identify specific risks for preconception intervention have been developed, often as part of the activities of prenatal clinics for high-risk women.

Many practitioners give advice regarding future childbearing as part of routine health maintenance. In addition, preconception care in primary care practice is included in visits for other purposes: the school physical examination, the premarital examination, the family planning visit, and well-child care for another member of the family.

When services are provided as part of general preventive care or during visits for other medical conditions in primary care settings, preconception care is most effective. If a woman is seen by a health care provider during her reproductive years, the provider should consider the potential for pregnancy to be a part of usual health care and should consider the implications of the woman's present health status on a possible pregnancy.

The effectiveness and efficiency of preconception care may be reduced when such activities are separate from primary care. Revision of existing family planning clinic activities to include preconception risk assessment and care may also be effective, since such revision enhances existing care.

The introduction of preconception risk assessment and care into other settings used by high-risk women, such as substance-abuse clinics and sexually-transmitted-disease clinics, may be beneficial. Prepregnancy clinics, managed by specialists in maternal and fetal medicine, care for women with previously identified medical complications of pregnancy. These women also may benefit substantially from preconception care and early intervention.

SUMMARY

It is the opinion of the Panel that all women would benefit from preconception care. Such care should be available to all women and their partners and should be integrated into primary care services. Unfortunately, women most likely to benefit from preconception care are often those least likely to have access to it. For this reason, preconception care should be available in all health care settings in convenient community locations. Preconception care should also be made a part of family planning visits and any health care setting likely to serve women in their reproductive years. When a preconception visit takes place within the year that pregnancy occurs, the activities of the first pregnancy visit are simplified.

Although few studies were found that identified male issues in preconception counseling other than male-involvement programs in family planning and genetic counseling, the Panel feels that preconception care should involve the male partner and should be designed to encourage men to seek counseling and educational information.

The improvement of preconception care-giving skills should be promoted for all relevant providers, including family physicians, internists, obstetricians, nurse practitioners, nurse-midwives, pediatricians, and family-planning-clinic personnel. Preconception educational materials should be developed for professionals as well as women and their male partners.

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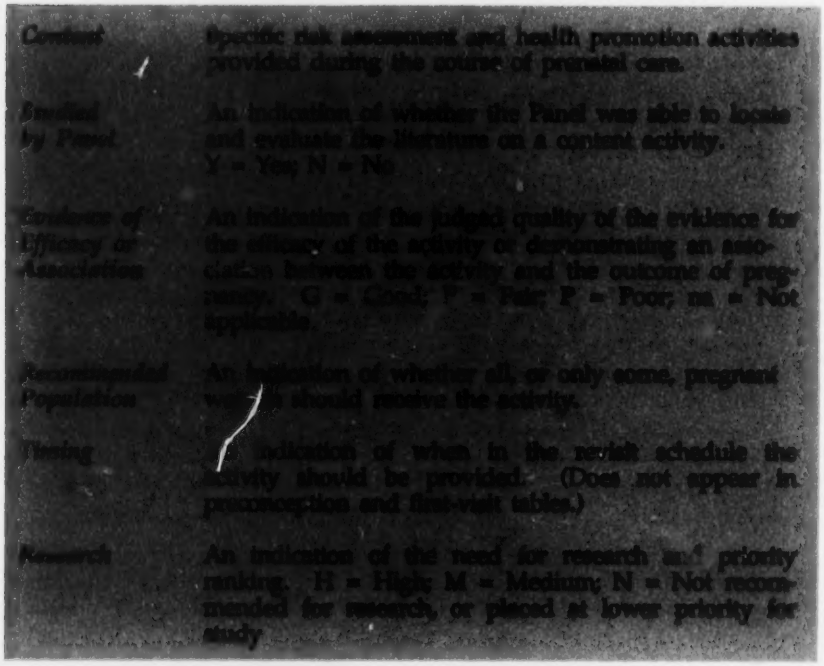
4

Components of Prenatal Care

The activities that constitute the content of prenatal care and the rationale for their selection are based on evidence in the literature or on clinical judgment when such evidence was not available. Appendix A contains a complete description of the evaluation of evidence.

The headings used in the content-of-prenatal-care tables are defined below.



Content	Specific risk assessment and health promotion activities provided during the course of prenatal care.
Studied by Panel	An indication of whether the Panel was able to locate and evaluate the literature on a content activity. Y = Yes; N = No.
Evidence of Efficacy or Association	An indication of the judged quality of the evidence for the efficacy of the activity or demonstrating an association between the activity and the outcome of pregnancy. G = Good; F = Fair; P = Poor; na = Not applicable.
Recommended Population	An indication of whether all, or only some, pregnant women should receive the activity.
Timing	An indication of when in the revisit schedule the activity should be provided. (Does not appear in preconception and first-visit tables.)
Research	An indication of the need for research and priority ranking. H = High; M = Medium; N = Not recommended for research, or placed at lower priority for study.

When the Panel recommends "N" for research, this does not mean that no further research is needed, but that no further research is needed to demonstrate association or efficacy.

Tables 4–1 through 4–12 outline the content of each visit. In chapter 5, timing for the delivery of prenatal care is specified in detail, and the visit schedules for parous (one or more previous births) and nulliparous (no previous births) women are delineated.

CONTENT OF THE PRECONCEPTION VISIT

Preconception care is divided into medical and psychosocial risk assessment, health promotion, and interventions to reduce psychosocial risk. Medical interventions are not discussed in detail since a substantial literature and practice of interventions by health providers already exists. In the tables following, the activities of the preconception visit are listed in detail.

Table 4-1. Content of prenatal care: Preconception visit

Content	Studied by Panel	Recommended Population
Risk Assessment		
History	N	All
Physical examination	N	All
Laboratory tests	Y	Some
Health Promotion		
Counseling to promote healthful behavior	Y	All
Information on proposed care	Y	All
Interventions to reduce psychosocial risk	Y	Some

Risk Assessment Activities

History. Medical history is an integral part of prenatal care. Contents of the medical history are identified in table 4–2. Taking and documenting this history is recommended for all women at the preconception visit or at the first pregnancy visit if a preconception visit has not taken place. The psychosocial history, as part of risk assessment, is also listed in table 4–2.

Table 4-2. Preconception risk assessment: History

Content	Provider for Patient	Evidence of Association	Recommended Population	Research
Medical				
Sociodemographic data	Y	G	All	N
Menstrual history	Y	G	All	N
Past obstetric history	Y	G	All	N
Contraceptive history	N	na	All	M
Sexual history	N	na	All	M
Medical/surgical history	Y	G	All	N
Infection history	Y	G	All	N
Family and genetic history	Y	G	All	N
Nutrition	Y	G	All	N
Psychosocial				
Smoking	Y	G	All	N
Alcohol	Y	G	All	H
Drugs	Y	G	All	N
Social support	Y	F	All	H
Stress levels	Y	F	All	H
Physical abuse	Y	G	All	H
Mental illness/status	N	na	All	H
Pregnancy readiness	Y	F	All	H
Exposure to teratogens	Y	G	All	N
Housing, finances, etc.	Y	G	All	N
Extremes of physical work, exercise, and other activity	Y	F	All	H

The Panel recommends that further studies be undertaken on many of these factors to determine direct links to poor outcome of pregnancy, particularly with respect to specific types of work and specific activity levels.

Physical Examination. The physical examination is performed for all women during the preconception visit or the first pregnancy visit. The elements of the physical examination are listed in table 4–3.

Table 4-3. Preconception risk assessment: Physical examination

Content	Covered by Panel	Evidence of Association	Recommended Population	Research
General physical examination	N	na	All	N
Blood pressure/pulse	Y	G	All	N
Height	Y	G	All	N
Weight	Y	G	All	H
Height/weight profile	Y	F	All	H
Pelvic examination and clinical pelvimetry	Y	P	All	M
Breast examination	N	na	All	N

Laboratory Tests. The laboratory tests that ideally should be performed prior to pregnancy are specified in table 4–4. In many cases, if the test is obtained preconceptionally, it need not be repeated during pregnancy. For example, if rubella immunity has been documented, a repeat rubella antibody serum serology is unnecessary. If, however, the woman is not rubella immune, preconceptional vaccination would be advised and pregnancy should be avoided for 3 months.

Screening via urine dipstick for protein and sugar can be done at this visit and could be eliminated from later visits when better assessments of diabetes, preeclampsia, or infection can be performed. Gonococcal cultures and hepatitis B antigen screening are recommended for all women because of the prevalence of these diseases in the general population. For women at high risk, nonimmunity for the hepatitis B antigen raises consideration of the need for vaccination; similarly, gonococcal cultures are

repeated later in pregnancy for selected populations. Screening for infections such as toxoplasmosis and CMV are more effective when done preconceptionally. Screening for tuberculosis is restricted to women at risk. HIV and illicit drug screening should be offered to all women.

Table 4-4. Preconception risk assessment: Laboratory tests

Test	Routine	Grade	Population	Response
Hemoglobin or hematocrit	Y	G	All	N
Rh factor	Y	G	All	N
Rubella titer	Y	G	All	N
Urine dipstick				
protein	Y	G	All	M
sugar	Y	G	All	M
Pap smear	N	na	All	M
Tuberculosis screen	Y	F	Some	N
Gonococcal culture	Y	G	All	N
Chlamydia culture or rapid screen	Y	G	Some	N
Syphilis test	Y	G	All	N
Hepatitis B	Y	G	All	N
Toxoplasmosis	Y	G	Some*	H
CMV	Y	G	Some*	H
Herpes simplex	Y	F	Some*	H
Varicella	Y	F	Some*	H
HIV	Y	G	All (offer)	H
Hemoglobinopathies	Y	G	Some	N
Tay-Sachs	Y	G	Some	N
Parental karyotype	Y	G	Some	N
Illicit drug screen	Y	G	All (offer)	H

*Panel was unable to reach agreement on whether screening for these infections should be recommended for some or all women.

Health Promotion Activities

If risk assessment is the screening process for treatment, then health promotion and interventions to reduce psychosocial risk are the preventive aspects of the preconception visit (tables 4–5 and 4–6). Health promotion consists of three parts: (1) counseling to promote and support healthful behavior, (2) general knowledge about pregnancy and parenting, and (3) specific information concerning proposed care and treatment.

Interventions to reduce psychosocial risk are important adjuncts to health promotion activities. The nutrition part of preconception care is an example: nutrition counseling (health promotion) and nutrition supplementation, vitamins, and iron supplementation (interventions). These are related but independent services. The *Surgeon General's report on nutrition and health* (Chapter 15: Maternal and Child Nutrition) provides guidelines (Department of Health and Human Services 1988). Although logic and judgment urge continuation of counseling and supplementation, further studies are needed to improve the quality and effectiveness of this health promotion activity.

Counseling includes helping the woman identify and avoid tobacco, alcohol, illicit and teratogenic drugs, and environmental toxins prior to conception. The general knowledge shared with women or couples during the preconception period includes planning for conception, sexuality counseling, and information sources on pregnancy and parenting.

At the end of the preconception visit, information should have been collected and counseling should have taken place for the first pregnancy visit to be facilitated, and preventive and supportive care should be in place relevant to the needs of the individual woman. The studies of health promotion activities were directed not toward evidence that the activity should be supported or avoided, but rather toward whether the education introduced to alter the woman's behavior had been effective or ineffective. Table 4–5 presents the content of health promotion activities and the evidence and recommendations based on such studies.

Table 4-5. Preconception health promotion activities

Content	Accepted by Panel	Evidence of Efficacy	Recommended Population	Recommended Provider
Counseling to Promote and Support Healthful Behavior				
Nutrition	Y	G	Some*	H
Avoidance of smoking	Y	G	All	H
Avoidance of alcohol	Y	P	All	H
Avoidance of illicit drugs	Y	P	All	H
Avoidance of teratogens	Y	P	All	H
Safer sex	N	na	All	H
Information on Proposed Care				
Need for early entry into prenatal care	N	na	All	N
Preparation for screening and diagnostic tests	Y	G	All	H

*Panel was unable to reach agreement on whether nutrition counseling should be recommended for some or all women.

The four categories of intervention to reduce psychosocial risk are shown in table 4–6, together with the evidence and recommendations based on the studies. For women who engage in smoking or substance abuse, referral to a program may result in their eliminating the behavior prior to pregnancy. Provision, prior to pregnancy, of nutrition supplementation or referral, home visits, social and financial resources, and other services to women who need them can reduce risk, improve the health of the woman, and improve the outcome of pregnancy.

The preconception visit should include the woman's partner and may take place at any time during the year prior to a planned pregnancy.

Table 4-6. Preconception intervention to reduce psychosocial risk

Substance Abuse Counseling or Referral to Treatment Programs				
Smoking cessation	Y	G	Some	H
Alcohol avoidance	Y	P	Some	H
Illicit drug avoidance	Y	P	Some	H
Nutrition Supplementation or Referral				
Counseling to improve adequacy of diet	Y	G	Some	H
Vitamin and iron supplementation	Y	F	Some	H
Program of Home Visits				
Need for visit identified	Y	P	Some	H
Type and timing	Y	P	Some	H
Other				
Home health agency	N	na	Some	H
Community mental health center	N	na	Some	H
Safe shelter	N	na	Some	H
Enrollment in medical assistance	N	na	Some	H
Assistance with housing	N	na	Some	H
Referral for social support	Y	F	Some	H

CONTENT OF THE FIRST PREGNANCY VISIT (6–8 WEEKS)

For purposes of simplicity, assuming a preconception visit has taken place, only the additional detail important to the first prenatal visit will be specified. It may be necessary to divide the first pregnancy visit into two visits to accomplish the necessary information exchange and examination and to avoid placing undue time requirements or stress on women or on providers. If there is no preconception visit, the content of that visit is incorporated into the content of the first pregnancy visit.

As noted several times, the first visit during pregnancy will be shorter and more effective if a preconception visit has taken place. If a preconception visit has not taken place, all of the content of the preconception visit (tables 4–2 through 4–6) must be added to the content shown in tables 4–7 through 4–12, because these activities are intrinsic to a first visit. The opportunity for primary prevention will be limited; for example, vaccinations will no longer be feasible. Nonetheless, when the first visit takes place at 6 to 8 weeks of gestation, the activities of prenatal care will be substantially more effective than when the first visit is delayed to the second or third trimester.

Risk Assessment Activities

History. An update of the medical history obtained at the preconception visit should be obtained for three items (medical and surgical, infection, and nutrition), and original information should be gathered on the history of the pregnancy to date. Psychosocial history needs to be obtained in four areas. The health care provider should determine whether additional history items from the preconception visit need updating (table 4–7).

Physical Examination. The physical examination is less extensive if a preconception examination has taken place. Nevertheless, some assessments should be repeated (table 4–6). Abdomen with fetal examination is needed if the first visit is delayed beyond the first trimester (table 4–8).

Table 4-7. First pregnancy visit risk assessment: History

Content	Included by Panel	Evidence of Association	Recommended Population	Research
Medical				
Medical/surgical update	Y	G	All	N
Nutrition update	Y	G	All	N
Current pregnancy to date	N	na	All	N
Psychosocial				
Smoking	Y	G	All	N
Alcohol use	Y	G	All	H
Drug use	Y	G	All	N
Extremes of physical work, exercise, and other activity	Y	F	All	H
Social support update	Y	F	All	H
Stress levels update	Y	F	All	H

Table 4-8. First pregnancy visit risk assessment: Physical examination

Content	Included by Panel	Evidence of Association	Recommended Population	Research
Blood pressure	N	na	All	N
Weight	Y	G	All	N
Pelvic examination for uterine size, dating, pathology	N	na	All	M
Breast examination	N	na	All	N

Laboratory Tests. If the tests recommended in table 4–4 have been obtained, then only the listed tests need to be repeated; of these, two are necessary for all women. Whereas the urine dipstick may be adequate screening for undiagnosed preexisting diabetes in the nonpregnant state, the physiologic changes of pregnancy make nonfasting blood glucose screening more appropriate for at-risk women at the first pregnancy visit. Thus, the laboratory tests called for in table 4–9 may be simplified if a preconception visit has taken place.

Table 4-9. First pregnancy visit risk assessment: Laboratory tests

Content	Studied by Panel	Evidence of Association	Recommended Population	Research
Hemoglobin or hematocrit	Y	G	All	N
Rh antibody screen	Y	G	Some	N
Syphilis test	Y	G	Some	N
Random blood glucose level	Y	G	Some	N
Gonococcal culture	Y	G	Some	N
Urine culture	Y	G	All	H

Scheduling of an ultrasound test in pregnancy is currently recommended only if the duration of gestation is uncertain or if problems for the fetus are anticipated. This area has been reviewed by a previous National Institutes of Health Consensus Panel and has not been restudied by this Panel (National Institutes of Health 1984). Research in this area continues to be a high priority, and, as with any procedure, the Panel recognizes that this recommendation may change when new data are available.

Health Promotion Activities

As in risk assessment, the health care provider is encouraged to exercise judgment, based on previous patient information, in using the health promotion activities listed in table 4–10.

Interventions to reduce psychosocial risk, as elaborated in table 4–6, need to be provided at this first pregnancy visit if the preconception visit has not taken place.

Table 4-10. First pregnancy visit: Health promotion activities

Content	Studied by Panel	Evidence of Efficacy	Recommended Population	Research
Counseling to Promote and Support Healthful Behavior				
Nutrition counseling	Y	G	Some*	H
Avoidance of teratogens	Y	P	All	H
Safer sex	N	na	All	H
General Knowledge of Pregnancy and Parenting				
Physiologic and emotional changes in pregnancy	N	na	All	H
Sexuality	N	na	All	H
Fetal growth and development	Y	P	All	H
Self-help strategies for discomforts	Y	P	Some	H
Early pregnancy classes on nutrition, physiologic changes, psychological adaptation, exercise and fitness	Y	P	All	H
Information on Proposed Care				
Preparation for screening and diagnostic tests	Y	G	All	H
Content and timing of prenatal visits	N	na	All	H
Need to report danger signs	N	na	All	H

*Panel was unable to reach agreement on whether nutrition counseling should be recommended for some or all women.

CONTENT OF PREGNANCY REVISITS

Recommendations for second and subsequent visits during pregnancy are based on the assumption that a woman has had a preconception visit within 1 year of pregnancy and a first pregnancy visit at 6 to 8 weeks gestation (a second visit near 8 weeks if the first pregnancy visit is divided into two segments). If these preferred activities have not taken place, a first visit must be expanded to include many now-overdue prenatal-care activities and should include review of portions of the preconception and first pregnancy visits.

In the absence of risk factors, revisits include continuing risk assessment and health promotion activities as needed. If risk is identified in any category, increased assessment and intervention, either medical or psychosocial, should take place and should be scheduled as good patient care dictates. The intensity and timing of these visits will depend on the needs and specific risks of the pregnant woman and her family.

Content of the remaining prenatal visits is summarized in tables 4–11 and 4–12.

Table 4-11. Pregnancy revisits: Risk assessment activities

Content	Routine to Record	Frequency of Assessment	Recommended Personnel	Timing	Research
History					
Continuing assessment of pregnancy to date. This may also include exposure to infection.	N	na	All	Each visit	N
Physical Examination					
Blood pressure	Y	F	All	24 weeks and after*	N
Weight	Y	P	All	Each visit	N
Fundal height/growth	Y	G	All	16 weeks and after	N
Fetal lie/presentation/ engagement/FHR	N	na	All	24 weeks and after	N
Cervical examination	Y	P	All	Begin 41 weeks	M
Laboratory Tests					
Repeat hemoglobin or hematocrit	Y	G	All	after 24 weeks	N
Repeat Rh antibody screen	Y	G	Some	26-28 weeks	N
Diabetic screen	Y	G	All	26-28 weeks	M
Repeat syphilis test	Y	G	Some	3rd trimester	N
Repeat gonococcal culture	Y	G	Some	36 weeks	N
Repeat HIV screen	Y	G	Some	36 weeks	H
Maternal serum alpha-fetoprotein	Y	G	All	14-16 weeks	M
Obstetric ultrasound	N	na	Some	when indicated	M

*Panel was unable to reach agreement on the frequency of blood pressure measurement.

Table 4-12. Pregnancy revisits: Health promotion activities

Content	Support by Panel	Evidence of Efficacy	Recommended Population	Timing	Research
Counseling to Promote and Support Healthful Behavior					
Avoidance of teratogens	Y	P	All	Each visit	H
Safer sex	N	na	All	Each trimester	H
Maternal seatbelt use	Y	G	All	Each trimester	N
Support for smoking cessation	Y	G	Some	Each visit	
Work counseling	Y	G	Some	Each visit	H
Nutrition counseling	Y	G	Some	Each visit	M
Signs and symptoms of preterm labor	Y	F	All	2nd & 3rd trimester	H
General Knowledge of Pregnancy and Parenting					
Physiologic and emotional changes	N	na	All	1st & 3rd trimesters	H
Sexuality counseling	N	na	All	Last half of pregnancy	H
Fetal growth and development	Y	P	All	Each visit	
Self-help strategies for discomforts	Y	P	Some	Each visit	H
General health habits (hygiene, exercise and muscle toning, rest and sleep patterns)	Y	F	All	Each visit	M
Promotion of breast feeding	Y	F	All	26 weeks and after	H
Infant car seat safety	Y	G	All	Each visit	H
Classes—preparation for childbirth, parenting	Y	G	All	32 weeks	H
Family roles and adjustment	Y	G	All	38 weeks	H
Information on Proposed Care					
Laboratory tests	N	na	All	Before testing	N
Discussion of birth plan	N	na	All	3rd trimester	N
When to call, where to go when in labor	N	na	All	3rd trimester	M

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5

When to Deliver the Content of Prenatal Care

INTRODUCTION

This chapter delineates when the content of prenatal care should be delivered. For many women, pregnancy is a planned event filled with joyous expectation. These women are generally in good health with no apparent medical or psychosocial risks. Ideally, these women are identified as free from risk at the preconception visit (chapter 3). Consequently, prenatal care for healthy pregnant women focuses on health promotion. Because risk may arise at any time during pregnancy, however, continuing assessment is essential. This chapter contains lists of the risk assessment and health promotion activities for each prenatal visit, plus a narrative describing the timing, frequency, and details of the visit.

Based upon scientific evidence and expert clinical judgment regarding effectiveness for identifying and modifying risk and the success of medical and psychosocial interventions, a chronological sequence of prenatal care visits emerged. The suggested schedule of visits is dependent upon and derived from the content of prenatal care required to meet the objectives of prenatal care.

The Panel was mindful that the success of prenatal care requires the use by the health professional of activities known to be effective and the active participation of the pregnant woman and her support individuals.

Table 5–1 shows the risk assessment component of the content of prenatal care, arrayed on the suggested core visit schedule, to illustrate how this component is delivered.

Table 5-1. Delivery of the risk assessment component*

	Preconception Visit	5-9 Weeks (First Visit)	14-16 Weeks	24-28 Weeks	32 Weeks	36 Weeks	38 Weeks	39 Weeks	40 Weeks	41 Weeks
History										
Medical	✓									
Psychosocial	✓									
Update medical/psychosocial		✓	✓	✓	✓	✓	✓	✓	✓	✓
Physical Examination										
General	✓									
Blood pressure/pulse	✓	✓		✓	✓	✓	✓	✓	✓	✓
Height	✓									
Weight	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ht/Wt profile	✓									
Pelvic examination/pelvimetry	✓	✓								
Breast examination	✓	✓								
Fundal height			✓	✓	✓	✓	✓	✓	✓	✓
Fetal position/heart rate				✓	✓	✓	✓	✓	✓	✓
Cervical examination										✓

* This table only includes risk assessment activities for all women; risk assessment activities for some women (e.g., chlamydia screening), health promotion, and interventions for medical and psychosocial risks identified are not shown in this illustration.

Table 5-1. Delivery of the risk assessment component (continued)*

	Preconception Visit	6-8 Weeks (First Visit)	14-16 Weeks	24-28 Weeks	32 Weeks	36 Weeks	38 Weeks	39 Weeks	40 Weeks	41 Weeks
Laboratory Tests										
Hemoglobin or hematocrit	✓	✓		✓						
RH factor	✓									
Pap smear	✓									
Diabetic screen				✓						
MSAFP			✓							
Urine dipstick	✓									
protein	✓									
sugar	✓									
Urine culture		✓								
Infections										
rubella titer	✓									
syphilis test	✓									
gonococcal culture	✓	✓								
hepatitis B	✓									
HIV (offered)	✓	✓								
Illicit drug screen (offered)	✓									

* This table only includes risk assessment activities for all women; risk assessment activities for some women (e.g., chlamydia screening), health promotion, and interventions for medical and psychosocial risks identified are not shown in this illustration.

Risk assessment combined with professional judgement exercised by the prenatal care provider may result in the need for an increase in the number of visits and modification of their content (risk assessment, health promotion, and intervention) when necessary. Prenatal care providers have been defined in chapter 1, but it must be reemphasized that there should be a single prenatal care provider with primary and comprehensive responsibility. It is that provider who should be available to support the woman if unexpected pregnancy-related problems occur or are detected by risk assessment. Care may be delivered in an office, clinic, or through a home visit when necessary. Note that, if a preconception visit has taken place, many laboratory tests need not be repeated. Details of the content of each visit that are not represented on table 5–1 may be found in this chapter and in chapter 4.

A brief review of some of the definitions presented in the glossary in chapter 1 may be useful. A *prenatal visit* is an in-person encounter between the pregnant woman and her prenatal care provider. This contrasts with a *prenatal contact*, which is any other interaction between the pregnant woman and her prenatal care provider or any interaction between the pregnant woman and other specialized providers. This contact may be a telephone call rather than an in-person contact. The basic *content of prenatal care* forms the core of activities to promote health, assess risk status, and intervene in a timely fashion for all pregnant women, whether in the first or subsequent pregnancies.

Recommended content and timing results in a core schedule of nine visits for the healthy nulliparous woman and seven for the healthy parous woman; one visit occurs prior to conception in each case. Special requirements of prenatal visits for women at medical or psychosocial risk, in contrast to healthy women, are presented in chapter 6. In the at-risk population, prenatal care activities are individualized with expanded content that requires more frequent contacts and visits.

PRECONCEPTION VISIT

The preconception visit should precede pregnancy visits provided in prenatal care. Chapters 3 and 4 provide detail on the preconception visit.

FIRST PREGNANCY VISIT FOR HEALTHY WOMEN (6-8 WEEKS OF GESTATION)

Risk Assessment

History of pregnancy to date
- medical
- psychosocial

Physical examination for uterine size

Laboratory tests
- hematocrit or hemoglobin
- rubella titer (if no preconception visit)
- blood/Rh, Rh titer (if no preconception visit), antibody screen
- HIV offered
- gonorrhea culture
- pap smear (unless obtained during last year)
- urinalysis—protein, glucose, no microanalysis
- urine culture

Dating pregnancy

Health Promotion

Counseling to promote and support healthful behaviors
- smoking cessation, alcohol avoidance, illicit drug and teratogen avoidance
- nutrition
- safer sex

General knowledge of pregnancy and parenting
- physiologic and emotional changes in pregnancy
- sexuality
- self-help for discomforts
- general health habits—hygiene, exercise and muscle toning, rest and sleep patterns
- early pregnancy classes—encouragement of good nutrition, exercise, and fitness

Information on proposed care
- need for early entry into prenatal care
- preparation for screening and diagnostic tests
- content and timing of prenatal visits
- need to report danger signs

Design of Pregnancy Plan

Ideally, the first pregnancy visit should take place at 6 to 8 weeks of gestation. All visits following the preconception visit are numbered consecutively from the first pregnancy visit. The content of the first pregnancy visit parallels the content of the preconception visit with the addition of specified new activities. If preconception care has been given, many activities need not be repeated.

Content

Two components and a planning activity take place during this first pregnancy visit: (1) risk assessment, which includes dating the pregnancy, (2) health promotion, and (3) design of a care plan for the pregnancy.

Risk Assessment. The list of activities is based on the assumption that a preconception visit has taken place within the last 12 months. If it has not, the contents of the preconception visit are added. Thus, taking the history applies to the current pregnancy only. Added information documents the current pregnancy to date and any maternal problems with bleeding, nausea, or medications. If the preconception visit took place within the last 12 months, the history and physical examination is tailored to pregnancy history, pregnancy confirmation (dating), and pregnancy planning. Findings from the history and physical examination provide the bases for identifying the risk status and for guiding interventions tailored to the specific needs of the pregnant woman.

There is no need to repeat the general physical examination. Added items are measuring the size of the pregnant uterus and checking for the presence of pelvic abnormalities. Specifics of the history and an outline of the physical examination were detailed in chapter 4. Justification for each element of the history is provided in table 4–2.

Initial pregnancy risk assessment also includes a series of laboratory tests for all women; these tests are described in detail in chapter 4. Additional tests include an antibody screen, a urine screen for infection, and a screen for hepatitis B. There is no need to repeat the Rh study if the patient is Rh positive. It should be noted that routine urinalysis for protein and glucose is not included after the first visit unless a risk situation is evident. HIV testing should once again be offered to all women.

When attempting to date the pregnancy, indicators of gestational age may include the woman's knowledge of the time of conception, recording or remembering the date of the last normal menses, and early uterine sizing by palpation at the first pregnancy visit. In women with prepregnancy amenorrhea, irregular cycles, or an uncertain last menstrual period, early ultrasonography may be indicated. Accurate dating of pregnancy is important for later diagnosis and treatment of intrauterine growth retardation (IUGR), preterm and postterm labors, and medical decision making when unexpected risks occur.

Health Promotion. All categories of health promotion need to be considered during each prenatal visit. They are (1) counseling to promote and support healthful behaviors, (2) general knowledge of pregnancy and parenting, (3) information on proposed care.

Examples of specific health promotion activities during this first pregnancy visit include counseling on smoking cessation, alcohol avoidance, avoidance of teratogenic drugs, and maternal seatbelt use, as well as review of early pregnancy signs and symptoms such as fatigue and nausea, including ways to ameliorate them.

The rationale for including these health promotion activities in the first pregnancy visit is to encourage early avoidance of teratogenic agents such as drugs and alcohol, to attempt to reduce hazards of maternal smoking, and to provide anticipatory guidance about what to expect, explaining what is normal and what needs to be reported during early pregnancy.

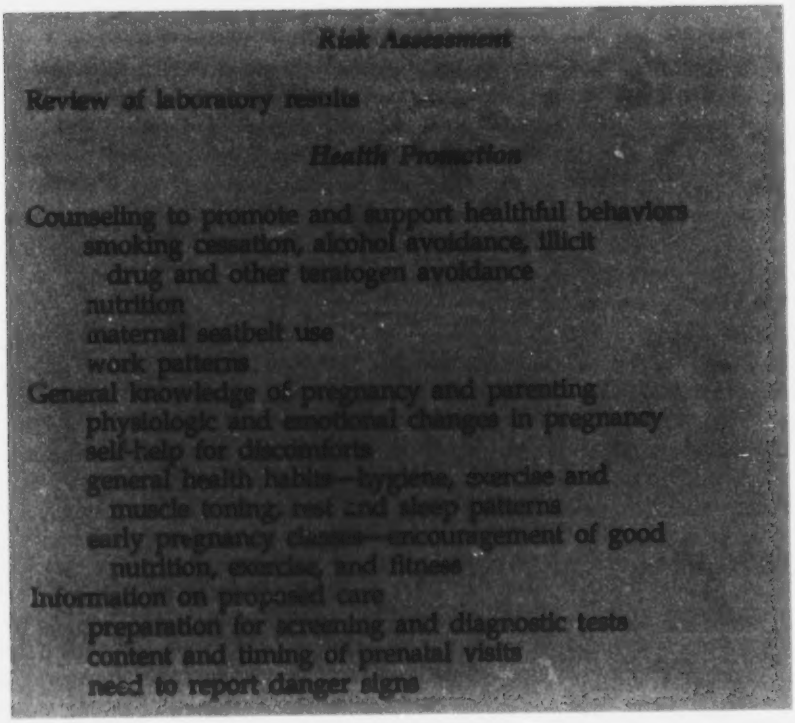
Sharing information about pregnancy with the woman encourages her active participation in her care, helps her know what is taking place or what will take place, and lets her know what information needs to be shared promptly with her prenatal care provider. Proper seatbelt use protects the woman who is pregnant from unnecessary harm if she is involved in an auto accident.

Design of Pregnancy Plan. The plan should include the content and schedule of prenatal care, which may now be tailored to the health and individual needs of the woman. Women who remain healthy during pregnancy have more flexibility in the content and scheduling of visits. If apparent risks have been identified, the care plan should be altered to meet the specific needs noted (chapter 6).

Timing

A preconception visit would be helpful in accomplishing most first-visit activities; the timing of the first pregnancy visit should be as early as possible in pregnancy, preferably at 6 to 8 weeks of gestation (no later than 8 weeks). This is to identify apparent risks as early as possible, to maximize the chances for successful intervention or avoidance of teratogens. Dating the pregnancy is likely to be more accurate with a shorter recall period for the woman, and uterine sizing by palpation is more accurate after 4 or 6 weeks; thus, the Panel arrived at timing this visit for 6 to 8 weeks gestation.

SECOND PREGNANCY VISIT NULLIPAROUS WOMEN; SECOND PREGNANCY CONTACT PAROUS WOMEN (WITHIN 4 WEEKS OF PREVIOUS VISIT)


Risk Assessment
Review of laboratory results
Health Promotion
Counseling to promote and support healthful behaviors
smoking cessation, alcohol avoidance, illicit drug and other teratogen avoidance
nutrition
maternal seatbelt use
work patterns
General knowledge of pregnancy and parenting
physiologic and emotional changes in pregnancy
self-help for discomforts
general health habits—hygiene, exercise and muscle toning, rest and sleep patterns
early pregnancy classes—encouragement of good nutrition, exercise, and fitness
Information on proposed care
preparation for screening and diagnostic tests
content and timing of prenatal visits
need to report danger signs

Content

Two components should take place at this time. These should be done during an in-person contact for nulliparous women; a telephone call may be adequate for parous women. There is no scheduled history, physical examination, or laboratory test for this visit. This visit is primarily to educate and to support the pregnant woman and her family. Information on how the woman and family are responding to the pregnancy is obtained as well as information about exercise, work, and other health habits. Counseling should be designed to meet the activities of the woman. In the absence of medical disease or symptoms, no further physical assessment is indicated at this visit.

Risk Assessment. Risk assessment activities at this visit consist of reviewing the laboratory test results. It is important to share these results with the woman clearly and fully. A well-informed woman can take responsibility for the things that need correction or treatment. Knowledge of apparent risks that may have been identified will also prepare her for interventions and outcomes that may lie ahead. Reinforcement of the woman's "healthy" status assists the provider in planning the timing and content of the next prenatal visit.

Health Promotion. The health education content of the second visit or contact should include a nutritional assessment with counseling geared toward the woman's specific nutritional needs. The second visit should also include job activity counseling. Anticipatory guidance should be provided on the maternal serum alpha-fetoprotein (MSAFP) screening recommended at 14 to 16 weeks gestation, and information should be given to help the nulliparous woman understand what is happening to her body (e.g. fatigue, emotions, weight). The final health promotion activity at this visit is to reinforce healthy behaviors, particularly for women who have given up smoking or other behaviors that place them or their fetuses at risk, and to encourage stopping unhealthy behaviors for those who have not done so.

Poor nutritional intake is associated with maternal anemia and IUGR. Excessive maternal exercise and physical work demands may have negative effects on pregnancy, though further study is needed. Until better data are available, the Panel agreed that women should be counseled to avoid excesses of exercise and physical activity during pregnancy.

Timing

This prenatal contact or visit should take place within 4 weeks of the first visit, preferably by the 10th week of gestation to enable the woman to avoid hazards.

THIRD PREGNANCY VISIT NULLIPAROUS WOMEN; SECOND PREGNANCY VISIT PAROUS WOMEN (14-16 WEEKS)

Risk Assessment

Partial history
Vaginal bleeding
Psychosocial factors
Partial physical
    auscultation
    FHR (Doppler)
    fundal height/weight
Laboratory tests
    MSAFP

Health Promotion

Counseling to promote and support healthful behavior
    smoking cessation, alcohol avoidance, illicit drug and other teratogen avoidance
    nutrition
General knowledge of pregnancy and parenting
    physiologic and emotional changes in pregnancy
    sexuality
    fetal growth and development
    self-help for discomforts
    general health habits—hygiene, exercise and muscle toning, rest and sleep patterns
Information on proposed care
    preparation for screening and diagnostic tests
    content and timing of prenatal visits
    need to report danger signs
    signs and symptoms of preterm labor

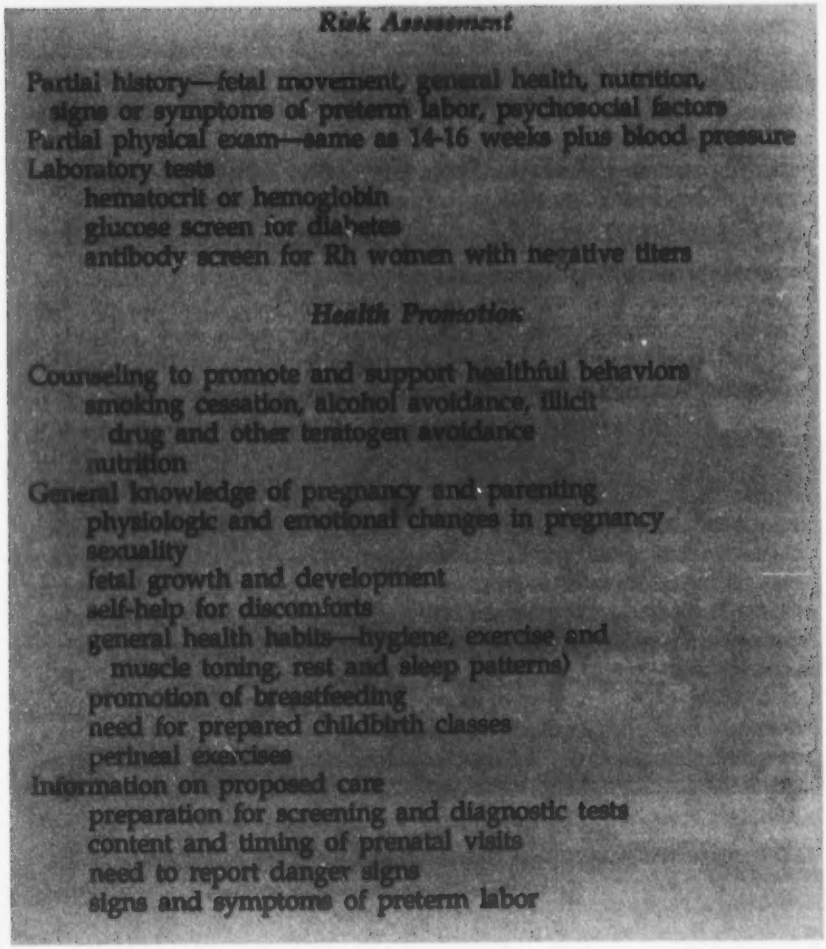
Content

Risk Assessment. This visit should include a history of the pregnancy to date, including any reports of nausea or vomiting, bleeding, or the beginning of fetal movements. Continuing assessments of psychosocial risk, including levels of maternal anxiety and support and health behaviors, are indicated to plan needed interventions or to counsel about risks. The visit should include a partial physical examination including maternal weight,

auscultation of the fetal heart rate, and abdominal assessment of fundal height for growth and for comparison with expected size for dates. The MSAFP screen for neural tube and chromosomal defects is recommended to be offered to all women as part of risk assessment. Full disclosure of risks, benefits, and possible need for followup testing should be communicated prior to obtaining the woman's consent for the initial screen. Other historical or physical investigations should be done on indication. A change in the risk status of the pregnant woman calls for additional investigations.

Health Promotion. Since the growth of the fetus is becoming perceptible, knowledge of its development helps the woman and family to begin to identify with the fetus. She should be informed about the importance of documenting the first perceived fetal movement to help confirm dating of the pregnancy. She should receive reassurance regarding changing body image and sexuality and should receive information regarding seatbelt use to adjust for the growing fetus. She should also receive information on the need for a 1-hour glucose screen for diabetes scheduled for the next visit and information on signs and symptoms that should be reported prior to the next scheduled visit, e.g. vaginal bleeding or uterine contractions.

FOURTH PREGNANCY VISIT NULLIPAROUS WOMEN; THIRD PREGNANCY VISIT PAROUS WOMEN (24-28 WEEKS)


Risk Assessment
Partial history—fetal movement, general health, nutrition, signs or symptoms of preterm labor, psychosocial factors
Partial physical exam—same as 14-16 weeks plus blood pressure
Laboratory tests
hematocrit or hemoglobin
glucose screen for diabetes
antibody screen for Rh women with negative titers
Health Promotion
Counseling to promote and support healthful behaviors
smoking cessation, alcohol avoidance, illicit drug and other teratogen avoidance
nutrition
General knowledge of pregnancy and parenting
physiologic and emotional changes in pregnancy
sexuality
fetal growth and development
self-help for discomforts
general health habits—hygiene, exercise and muscle toning, rest and sleep patterns)
promotion of breastfeeding
need for prepared childbirth classes
perineal exercises
Information on proposed care
preparation for screening and diagnostic tests
content and timing of prenatal visits
need to report danger signs
signs and symptoms of preterm labor

Content

Risk Assessment. An interval history since the last visit should be obtained and should include questions on the general state of health, nutrition, fetal movement, and unusual symptoms such as frequent contractions or vaginal bleeding. Continuing assessment is indicated of psychosocial risks, maternal stress or anxiety, and habits to determine significant changes and the need

for support or other interventions. The physical examination should include weight as a measure of health for the woman and fetus; blood pressure as a continuing screen for hypertension; and auscultation of fetal heart rate, assessment of fetal activity, and fundal height for growth pattern.

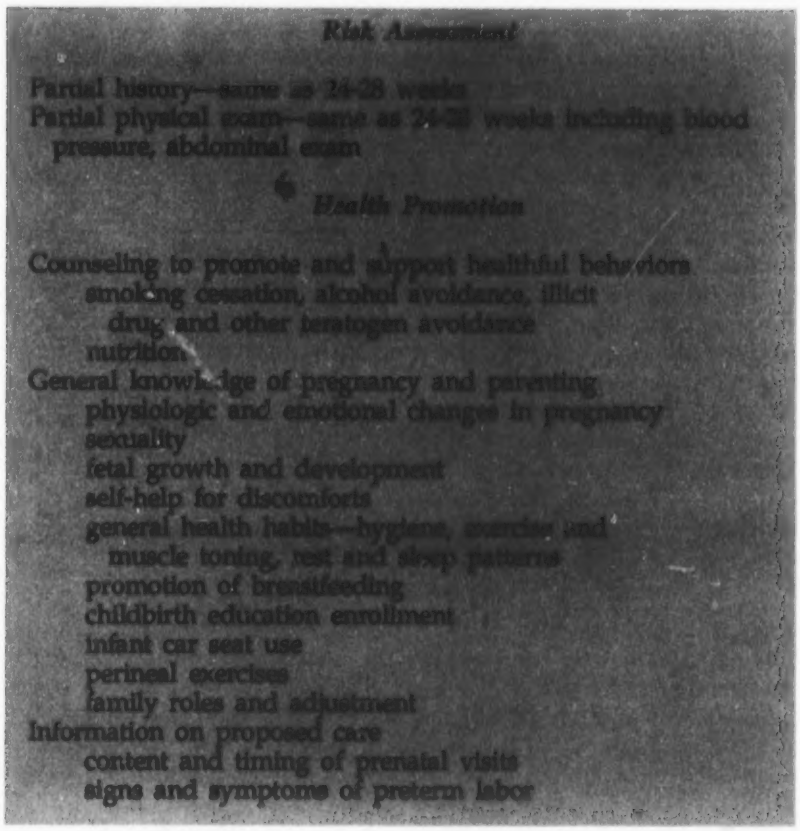
A repeat hematocrit or hemoglobin is indicated during the second or third trimester to help monitor nutritional status and identify anemia. Since the 1-hour glucose screen for diabetes is recommended for all women near 26 weeks, both laboratory tests can be done at this time. For Rh-negative women, a repeat Rh titer should be done at this visit and, if unsensitized, RhoGAM should be given.

Health Promotion. Several new items become important for the woman at this visit. First, the woman needs information about fetal development. Then she should be counseled about the benefits and availability of childbirth preparation classes. Such counseling should include a recommendation that all women participate in these classes. Third, methods of infant feeding should be discussed. The woman should be provided with information about lactation and should be encouraged to breastfeed and to discuss breastfeeding with her partner. Information on how to relieve common discomforts of pregnancy (e.g. backache, constipation, or leg cramps) and exercises to condition and maintain general body and perineal muscle tone are useful to the long-term well-being of the woman. Exercise levels and work demands should be reviewed and a plan made to modify any extremes in physical exertion or enforced prolonged standing.

Timing

The indicated timing for this visit is 24 to 28 weeks. This is the beginning of the third trimester and is 10 weeks after the previous risk assessment. At this time, diagnoses of problems such as toxemia, growth retardation, or abnormal fetal presentation may first be made. The timing also reflects the optimal screening time for pregnancy-induced diabetes and anemia.

FIFTH PREGNANCY VISIT NULLIPAROUS WOMEN; FOURTH PREGNANCY VISIT PAROUS WOMEN (32 WEEKS)


Risk Assessment
Partial history—same as 24-28 weeks
Partial physical exam—same as 24-28 weeks including blood pressure, abdominal exam
Health Promotion
Counseling to promote and support healthful behaviors
smoking cessation, alcohol avoidance, illicit drug and other teratogen avoidance
nutrition
General knowledge of pregnancy and parenting
physiologic and emotional changes in pregnancy
sexuality
fetal growth and development
self-help for discomforts
general health habits—hygiene, exercise and muscle toning, rest and sleep patterns
promotion of breastfeeding
childbirth education enrollment
infant car seat use
perineal exercises
family roles and adjustment
Information on proposed care
content and timing of prenatal visits
signs and symptoms of preterm labor

Content

Risk Assessment. This should include pregnancy history since the last visit, maternal general well-being, nutrition, and signs and symptoms of complications (e.g. bleeding, contractions, or pregnancy-induced hypertension). Psychosocial assessment should include changes in home environment, new environmental risks or stresses, adaptation to the pregnancy, and planning for the postdelivery environment. The partial physical examination should include maternal weight; blood pressure as a screen for pregnancy-induced hypertension; and auscultation of fetal

heart rate, assessment of fetal activity, and fundal height for growth pattern. These interim assessments should be a part of every subsequent prenatal visit until labor. Urinalysis for protein is not suggested unless signs or symptoms of possible toxemia are present.

Health Promotion. This is the time to reinforce and add to the woman's ability to identify early warning symptoms for pregnancy-induced hypertension, decreased fetal movement, and preterm labor. It is also time to discuss preparing for labor and birth and to develop a birth plan that helps the provider and family have realistic expectations of labor and of each other. Other educational activities include promotion of breastfeeding, infant car seat use, enrollment in prepared childbirth classes, review of exercise levels and work demands, and discussion of family roles and adjustments. Reinforcement of healthy behaviors such as avoiding cigarettes, alcohol, and illicit drugs continues to be important.

Timing

This visit is scheduled approximately 4 weeks after the last visit, at a reasonable time period for detecting pregnancy-induced hypertension or potential fetal growth problems.

PREGNANCY CONTACT, PREPARED CHILDBIRTH CLASSES (32–38 WEEKS, FIRST-TIME ATTENDERS; 36–38 WEEKS IF ATTENDED PREVIOUSLY)

A formal series of prepared childbirth classes is recommended for all women. For women who have never attended, the full series of sessions is recommended. For parous women who have attended during a previous pregnancy, a refresher series of one or two classes is recommended. These classes, at minimum, should educate women about the physiology of labor and birth, exercises and self-help techniques for labor, the role of support persons, family roles and adjustments, and preferences for care during labor and birth. The birth settings should be discussed and the woman's or couple's questions about the prenatal care provider and setting answered. This is a time when information relating to cesarean childbirth and vaginal birth after cesarean birth can be reviewed.

Timing

These classes are best placed during the third trimester of pregnancy, when interest in labor is evident and conditioned responses that are being learned will be used relatively soon. For classes to be completed before term labor (38 to 42 weeks), they should begin about 31 to 32 weeks so that they will be completed no later than 38 weeks. The refresher course is often only one or two classes and can be done at any time between 36 and 38 weeks.

Provider and Setting

The usual provider of prepared childbirth education is a childbirth educator with formal preparation in teaching such classes. Knowledge of the several kinds of childbirth education programs will help the prenatal provider assist the woman in choosing the series that best meets her needs. Choice of educator and setting will depend on what is available and accessible in the woman's community.

SIXTH PREGNANCY VISIT NULLIPAROUS WOMEN; FIFTH PREGNANCY VISIT PAROUS WOMEN (36 WEEKS)

Risk Assessment

Partial history—same as 24-28 weeks
Partial physical exam—same as 32 weeks

Health Promotion

Counseling to promote and support healthful behaviors
- smoking cessation, alcohol avoidance, illicit drug and other teratogen avoidance
- nutrition
- safer sex

General knowledge of pregnancy and parenting
- physiologic and emotional changes in pregnancy
- sexuality
- fetal growth and development
- self-help for discomforts
- general health habits—hygiene, exercise and muscle toning, rest and sleep patterns
- preparation for parenting classes
- promotion of breastfeeding
- signs and symptoms of labor
- infant car seat use

Information on proposed care
- content and timing of prenatal visits
- need to report danger signs
- signs and symptoms of preterm labor
- preparation for labor and birth
- birth planning
- when to call, where to go in labor

Content

Risk Assessment. This is the same history and physical examination as that specified for the 32-week visit, with increasing emphasis on fetal lie, position, and presentation and on maternal blood pressure. No pelvic examination is indicated except in women at high risk for sexually transmitted disease or if risk of premature labor is suspected. A culture for gonorrhea should be obtained from the former.

Health Promotion. Education should include information on signs and symptoms of labor, when and whom to call, and where to go when in labor. Changing patterns of eating and posture due to increased fundal size should be discussed along with notation of fetal movements and the woman's exercise and rest needs. Simple self-help measures for heartburn, backache, shortness of breath, insomnia, and physiologic edema should be taught so that the woman can reduce some of the common discomforts of the last month of pregnancy.

Timing

The 36-week visit is set at a 4-week interval from the last visit, with the understanding that if, in the interval, a woman develops specific pregnancy concerns, she will call her provider, and a more frequent visit schedule will be outlined according to need. For healthy women during the last weeks of pregnancy, the major events are continued growth and maturation of the fetus and physical changes and discomfort for the woman. Pregnancy-induced hypertension remains the major potential risk requiring professional monitoring. Providing that the woman knows the signs and symptoms of preeclampsia and is able to call her provider if they occur, there is little need to be seen more frequently by the provider. In addition, many women at this point in pregnancy will be attending prepared childbirth classes that will provide another opportunity for support.

SEVENTH PREGNANCY VISIT NULLIPAROUS WOMEN (38 WEEKS); SIXTH PREGNANCY VISIT PAROUS WOMEN (39 WEEKS)

Risk Assessment

Partial history—same as 24–28 weeks
Partial physical—blood pressure, fetal lie, presentation, descent

Health Promotion

Counseling to promote and support healthful behaviors
- smoking cessation, alcohol avoidance, illicit drug and other teratogen avoidance
- nutrition

General knowledge of pregnancy and parenting
- physiologic and emotional changes in pregnancy
- sexuality
- fetal growth and development
- self-help for discomforts
- general health habits—hygiene, exercise and muscle toning, rest and sleep patterns
- promotion of breastfeeding
- signs and symptoms of labor
- infant car seat use
- postpartum activity—including family planning
- newborn care
- family roles and adjustment

Information on proposed care
- content and timing of prenatal visits
- need to report danger signs
- signs and symptoms of preterm labor
- review of preparation for labor and birth
- review of birth plan
- when to call, where to go in labor

Content

Risk Assessment. The interval history should focus on signs and symptoms of labor, fetal activity, and symptoms of pregnancy-induced hypertension. The partial physical examination should include weight, blood pressure, fetal heart rate, fundal height, fetal size estimate, descent, presentation, and position.

Health Promotion. Activities should include reviewing the signs and symptoms of labor, answering questions the woman may have about signs or symptoms, and discussing when and whom to call when labor begins or when membranes rupture. A review of the birth plan is in order so that both provider and woman agree on the approach to labor and delivery. In addition, preparation for infant care, postpartum work, family roles and adjustment, and discussion of postpartum timing of family planning should be initiated.

Timing

This visit is timed for 2 weeks from the last visit for the nulliparous woman, in view of the potential for developing pregnancy-induced hypertension, and 3 weeks for the healthy parous woman. There is no specific need for this visit for the parous woman other than confirming her preparedness for labor and birth.

EIGHTH PREGNANCY VISIT NULLIPAROUS WOMEN (40 WEEKS)

Risk Assessment

Partial history—fetal movement counts, signs and symptoms of labor
Partial physical—same as 38 weeks

Health Promotion

Counseling to promote and support healthful behaviors
- smoking cessation, alcohol avoidance, illicit drug and other teratogen avoidance
- nutrition

General knowledge of pregnancy and parenting
- physiologic and emotional changes in pregnancy
- sexuality
- fetal growth and development
- self-help for discomforts
- general health habits—hygiene, exercise and muscle toning, rest and sleep patterns
- promotion of breastfeeding
- signs and symptoms of labor
- infant car seat use
- postpartum activity—including family planning
- newborn care
- family roles and adjustment

Information on proposed care
- need to report danger signs
- signs and symptoms of preterm labor
- review of preparation for labor and birth
- review of birth plan
- preparation for postterm tests
- when to call, where to go in labor

Content

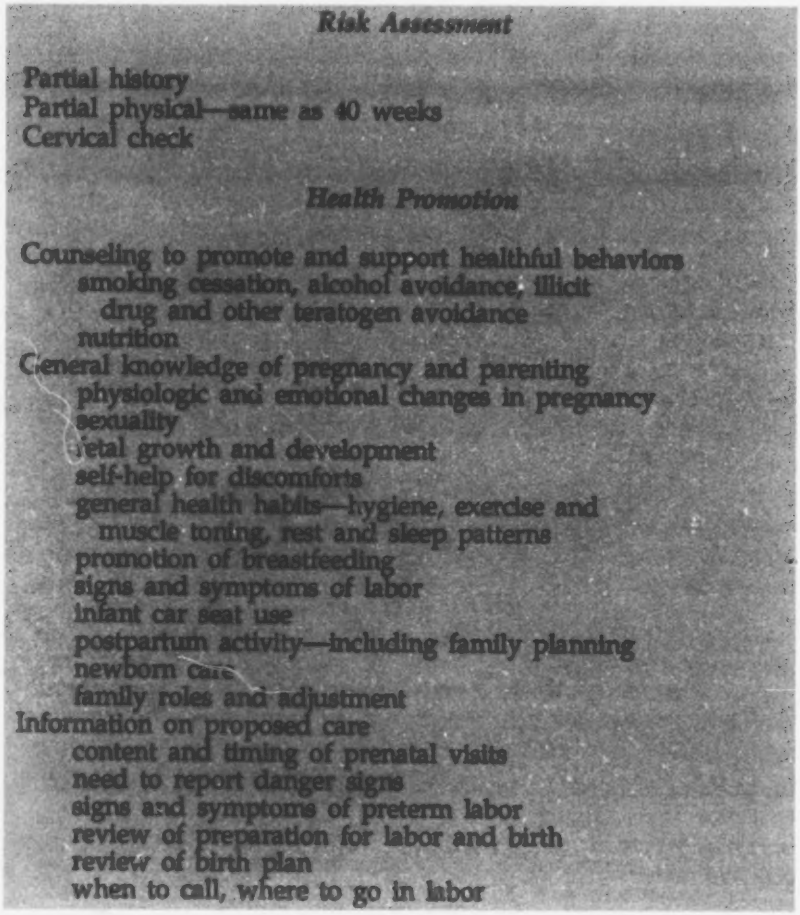
Risk Assessment. The history and physical are the same as those done during the visit in week 38, with emphasis on screening for pregnancy-induced hypertension and fetal condition, size, descent, and position.

Health Promotion. This should include review of labor preparation, review of danger signs for pregnancy-induced hypertension, discussion of postpartum needs and activity, help in the home, family roles and adjustments, and preparation for care of the newborn. Anticipatory guidance on the possibility for and type of postterm testing should be offered.

Timing

The nulliparous woman is at increased risk for pregnancy-induced hypertension and therefore needs to be followed more closely at the end of pregnancy. Weekly visits were not supported by the literature. Nonetheless, the Panel has concluded that weekly visits are appropriate.

NINTH PREGNANCY VISIT NULLIPAROUS WOMEN; SEVENTH PREGNANCY VISIT PAROUS WOMEN (41 WEEKS)


Risk Assessment
Partial history
Partial physical—same as 40 weeks
Cervical check
Health Promotion
Counseling to promote and support healthful behaviors
smoking cessation, alcohol avoidance, illicit drug and other teratogen avoidance
nutrition
General knowledge of pregnancy and parenting
physiologic and emotional changes in pregnancy
sexuality
fetal growth and development
self-help for discomforts
general health habits—hygiene, exercise and muscle toning, rest and sleep patterns
promotion of breastfeeding
signs and symptoms of labor
infant car seat use
postpartum activity—including family planning
newborn care
family roles and adjustment
Information on proposed care
content and timing of prenatal visits
need to report danger signs
signs and symptoms of preterm labor
review of preparation for labor and birth
review of birth plan
when to call, where to go in labor

Content

Risk Assessment. The history and physical are unchanged from previous visits. A vaginal examination is added to check for cervical effacement and dilation as potential for induction should pregnancy proceed postdates. This is the second and only other vaginal examination and cervical check since the first visit in the healthy patient.

Health Promotion. These activities are the same as those done for the nulliparous woman at the 40-week visit.

Timing

This visit is scheduled for the 41st week.

SUMMARY

This report discusses an enriched approach to prenatal care, which stresses the value and importance of prenatal care in terms of content and objectives, in contrast to the concept of simply counting visits. It must be emphasized that this recommended content and suggested visit and contact schedule is the core requirement for healthy women at no apparent risk during pregnancy. A comparison of the suggested core visit schedule with the one currently in use (American College of Obstetricians and Gynecologists 1989) has been prepared. It illustrates the change in emphasis toward early pregnancy and the preconception period and points up the themes of more care in the early phase and enrichment of content.

Indications for genetic counseling, chorionic villus sampling (CVS), amniocentesis, fetal testing, and postterm management fall outside the content and schedule of visits for healthy women. Once women carry their pregnancies beyond 41 weeks, more active intervention may be indicated. Recommendations for the content of prenatal visits or contacts for women at medical or psychosocial risk follow in chapter 6. Content and timing for the postpartum period were not studied, although content (including a review of family planning needs), and timing of care for the new mother, the infant, and the family are important to promote health care and improve the quality of life.

The comparison of the suggested visit schedule with the schedule currently in use is shown in figure 5-1. It is emphasized that the suggested schedule has more visits (beginning with preconception) early to assess risk and to permit delivery of health promotion and interventions for medical and psychosocial risks uncovered. When risk is uncovered, the frequency of visits, the content of visits, or both must be increased.

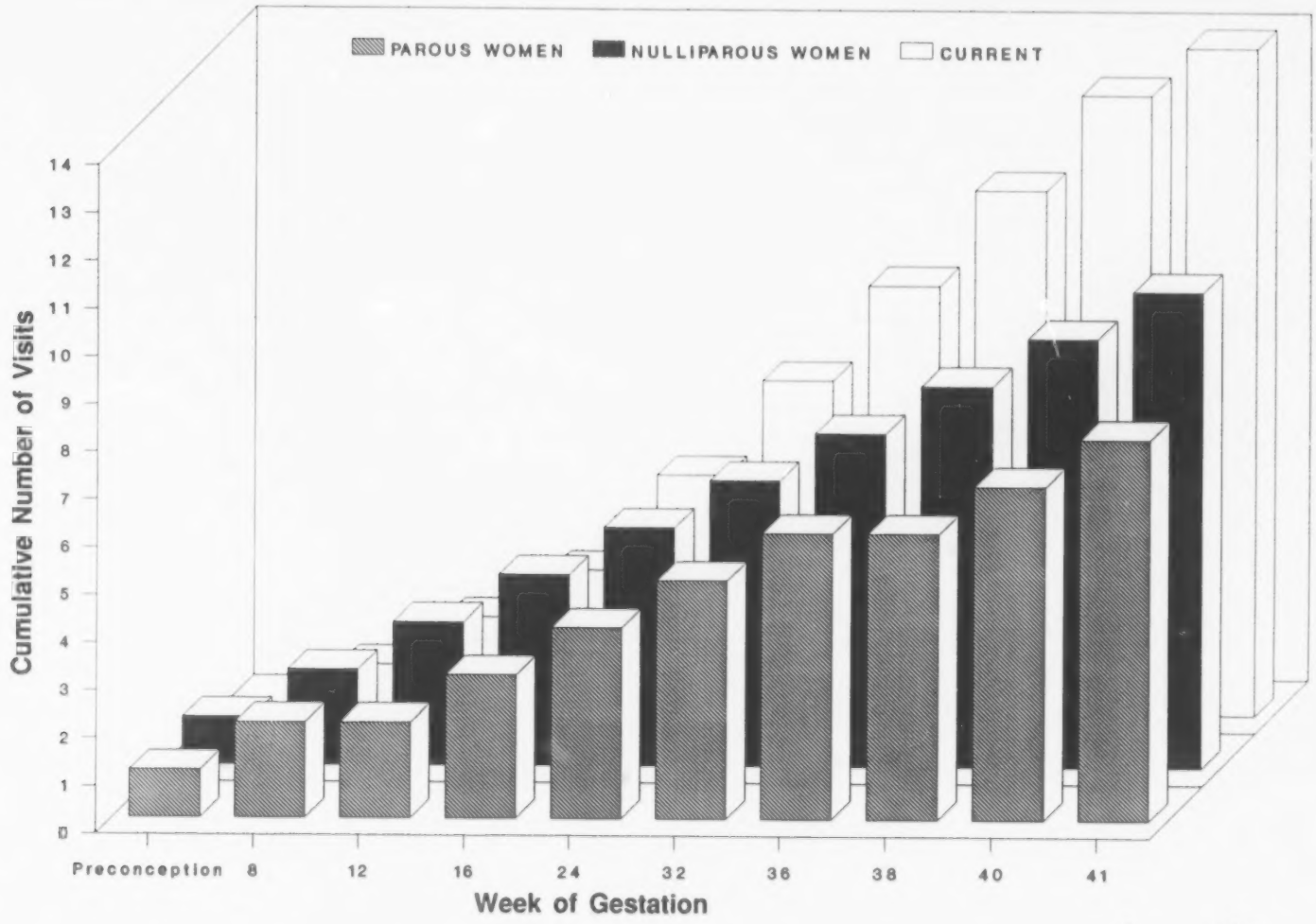


Figure 5-1. Comparison of Current and Recommended Cumulative Visits by Week of Gestation for Healthy Women

References

American College of Obstetricians and Gynecologists. 1989. *Standards for obstetric-gynecologic services.* 7th ed. Washington, DC: Author.

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6

Prenatal Care for Women at Risk

INTRODUCTION

Women who are contemplating pregnancy or who are pregnant may have increased risk for poor outcomes identified by risk assessment. Those who are at risk include those whose risks are primarily psychosocial and those whose risks are primarily medical. Medical and psychosocial risks are frequently found in the same women, and their effects may not be separable. In some instances, opinions will differ on whether a risk should be labeled medical or psychosocial. Despite the fact that a woman may see a different provider for specific medical or psychosocial risk, her primary prenatal care provider should be responsible for and knowledgeable about the woman's entire prenatal care program. Because of this approach to prenatal care and the added emphasis on psychosocial problems, parts of this chapter discuss interventions or treatments. However, the Panel does not provide complete guidelines for medical or psychosocial interventions in prenatal care.

MEDICAL RISK ASSESSMENT

In the delivery of prenatal care today, much effort is expended to identify factors that may place pregnant women at medical risk. Whether it is a record of medical illness, the past obstetrical history, the physical examination, or the performance of laboratory tests, the standardized data collection during much of prenatal care is a search for medical risk factors.

If the information collected during the preconception and prenatal visits does not in fact identify risk for poor outcome,

the information is of little use and should not be collected. For example, obtaining a woman's blood type at the first visit as a standard laboratory test is of questionable value, because a specific blood type does not coincide with any appreciable increased pregnancy risk. The test is not needed because appropriate medical care dictates that, prior to a blood transfusion, the test must be repeated. Thus, the specific blood type is laboratory information that need not be routinely collected during pregnancy. In contrast, determining the woman's Rh status and screening for irregular isoimmune antibodies was found to be of value, because knowledge of a positive antibody screen permits consideration of interventions to benefit the fetus and mother. It is recommended that this screen continue to be performed at the first visit. Similarly, when it was found that knowledge of the maternal cytomegalovirus antibody status does not help predict fetal risk and is not likely to effect a change in fetal outcome, it was concluded that collecting this information would not be useful; therefore, performing the test is not recommended for all women, although in a specific risk situation, it may be performed to define the presence of an acute infection. For each putative risk factor, a determination should be made of how the laboratory findings will contribute to the identification and prevention or treatment of risk.

The Panel believes that screening for new medical risk should be a continuing function of prenatal care, and that the timing of the screening may be influenced by the specific risk condition under consideration. The essential schedule of prenatal visits was designed to conform to the weeks of pregnancy when it was felt best to elicit specific information about changing risk factors. For example, the use of maternal serum alpha-fetoprotein for screening for neural tube defects is most accurate around 15 to 16 weeks gestational age. In contrast, screening for gestational diabetes appears to be most productive later in the second trimester. The basic recommended schedule includes visits at these gestational ages specifically for these purposes. The specific times for diabetes screening may be compared with screening for fetal growth retardation, which requires repetitive surveillance from the middle of the second trimester. On the other hand, screening for women at risk for rubella infection is best accomplished preconceptionally.

Many potential pregnancy risks discovered by history taking, physical examination, or laboratory tests occur in different degrees of severity or may be discovered at different times in the pregnancy. A pregnant woman, although at no apparent

risk, may develop new medical risk during the course of pregnancy. It is also apparent that, with many of these medical risks, the small risk of a poor outcome to the pregnancy may not indicate any change in either the content or frequency of prenatal care. For example, although women with sickle cell trait may be at slightly increased risk for urinary tract infection during pregnancy, there would appear to be little benefit to screening for urinary tract infection in this population more often than the one time recommended for all pregnant women. Since most providers would evaluate women with symptoms suggestive of a urinary tract infection whether the sickle trait was present or not, no change in timing or frequency of prenatal visits to screen for bacteria would be recommended for women with sickle cell trait. These women, however, would be classified as at risk because of the sickle cell trait, and their care would be individualized. In contrast, women with insulin-requiring diabetes are at risk for poor fetal and poor maternal outcome during the course of their pregnancy. Their metabolic control necessitates frequent prenatal visits. Because of these risks and the potential to ameliorate many of the poor outcomes associated with these risks by appropriate medical intervention, the need for significant alterations in both the frequency and the content of visits for women with such medical conditions is self-explanatory.

Numerical risk-scoring programs that assign points to psychosocial or medical risk factors were not judged favorably by the Panel. To date, such numerical risk scores have been of little use in managing treatment of patients, mostly because they lack adequate sensitivity and specificity. This contrasts with identifying a specific medical risk that, once identified, can be treated in that woman.

Other types of risks are population specific rather than individual specific. An example is the risk for sexually transmitted diseases (STDs), which are associated with various demographic characteristics such as young age, unmarried status, or living in a high-prevalence area. The presence of one of these demographic risk factors might suggest more frequent screening for STDs, and it is recommended that women with these demographic characteristics be screened for syphilis and gonorrhea in both the first and third trimesters (36 weeks), while, in low-prevalence populations, first-trimester screening is appropriate.

Similarly, since screening for gonorrhea requires a pelvic examination, in a high-risk population the content of a third-trimester prenatal visit would be changed to include a pelvic

examination with testing for gonorrhea as well as a blood test for syphilis. Positive findings from these tests would in turn require changes in content and timing of prenatal care, which would include treatment, further surveillance, and screening for additional STDs.

In women with medical risk, it is important to consider the concept of graded levels of prenatal care. For example, the complexities of managing some pregnancies complicated by insulin-requiring diabetes are such that appropriate medical care can be monitored only by a physician with specialized training. Other women at medical risk, such as those who are Rh negative but unsensitized, may require only continued screening and RhoGAM administration, which can be handled appropriately by a provider with less training.

The location in which care is provided depends on both the type of risk and the level of care available in the practice setting. In a practice setting with limited ability to provide highly technical or sophisticated care, it may be appropriate to include in the content of an early prenatal visit a discussion about the potential need to transfer to a different provider in a different location if certain conditions arise. Preterm labor, for instance, is not usually predictable; in fact, most women at high risk for preterm delivery deliver at term. Therefore, in a practice setting in which women in preterm labor must be referred to a different location, a discussion of potential transport for this condition is an appropriate part of the content of prenatal care. On the other hand, a woman receiving care in a location with tertiary care capabilities would not routinely need that discussion.

PSYCHOSOCIAL RISK ASSESSMENT

The Panel defined three categories of psychosocial risk: social factors, psychological factors, and adverse health behaviors. In individual instances, exceptions to the categorical classification may occur, and the woman may not be at increased risk. For example, the single-parent planned pregnancy by the financially competent working woman is not usually considered a pregnancy at risk. Psychosocial risk is an emerging concept; the presence and degree of risk associated with some of the factors is currently a judgment. The following discussion is not exhaustive.

Social Factors

Social factors that may be associated with psychosocial risk during pregnancy include inadequate housing, low income, less than high school education, working in a physically strenuous or potentially chemically toxic environment, and single marital status. Other factors that may place a pregnant woman at risk are inadequate nutritional resources, communication barriers, and adolescence (less than 18 years of age) or advanced age (35 years of age or older).

Psychological Factors

Among the psychological factors that may place a pregnant woman at risk are inadequate personal support systems and coping mechanisms, excessive ambivalence about the pregnancy, high stress and anxiety, living in an abusive situation, and psychiatric conditions.

Adverse Health Behaviors

Health behaviors of the pregnant woman that may place her at risk for an adverse pregnancy outcome or interfere with her attainment of the objectives of prenatal care include smoking, illicit drug use, alcohol abuse, poor nutritional choices, and excessive exercise.

TIMING OF CARE

Attention to psychosocial or medical risk does not simply mean an increased frequency of visits. The crucial issues are the visit content, the available resources, and the adequacy of the mobilization of these resources for the woman and her family. Because of the emphasis in this report on the changing concept of prenatal care with respect to psychosocial risk, the Panel chose to present the services that are needed to identify and care adequately for women with psychosocial risk. These are also discussed in chapters 3 and 4.

Generally, a risk-responsive approach will result in an increase in the number of visits and contacts *early* in pregnancy to identify needs and initiate interventions. An essential component of adequate care is the establishment of a positive relationship

between the woman and her prenatal care provider. The Panel believes that risk will be prevented through earlier identification and intervention.

CORE SERVICES IN A PSYCHOSOCIAL RISK PROGRAM

Prenatal care providers regularly caring for women at psychosocial risk should have a core set of services available within their practices. These services should promote early entry to care through preconception and early pregnancy assessment and should facilitate assessment of the family and home environment. Providers should carry out a continuing assessment of risk and needs, regularly evaluate patient progress, and coordinate services needed for the visits.

Specific problem-oriented services may be available directly from the primary prenatal provider or associated care team, by consultation with a resource outside the provider's practice, or by transfer to another provider for prenatal care if the capability is not available.

A patient scheduling system should minimize waiting time prior to initial entry for care. The system should be sufficiently flexible to accommodate to the woman's needs: evening or weekend hours may be necessary. The providers or other team members should have sufficient time available for women with complex psychosocial problems. Outreach to women delaying entry to care, as well as outreach for women in care, may be required to foster healthy behaviors.

Home Visits

The studies reviewed by the Panel provide evidence of the effectiveness of a regular schedule of home visiting in achieving many of the objectives of prenatal care among women at increased social and medical risk. Such programs may involve visits to the home on a regular basis during the prenatal period. Visits of equal or somewhat declining frequency may be needed beyond birth. The home visitors may be public health nurses or health care workers with specialized training and supervision. Home visitors usually cover specific material at each visit or over a period of time, although the content of the visit may be modified depending on the situation. Home visitors may

provide or arrange for transportation and engage in other supportive activities.

A more extensive discussion of home visiting is contained in a background paper that will be part of a separate publication (Klerman 1990).

Case Management and Access

Following the initial assessment, the practice setting should have an organized approach to case management. Case management merges the expertise of team members in settings with interdisciplinary staff. In the case conference, team members should define the care plan, develop a schedule of contacts, monitor care, and, if necessary, modify the plan throughout the pregnancy. The practice setting should have an information system to track women and facilitate case management.

The basic expertise necessary at the practice setting or the care center include psychological, social work, public health nursing, nutrition, and health education skills, in addition to traditional primary care skills, to carry out the tasks. Among needed social support services are those designed to improve access. Enhancing access serves the dual purpose of promoting earlier first visits and subsequent keeping of appointments. Such services include removing financial barriers, helping with transportation and child care, and making providers available in a friendly and predictable setting on a scheduled basis and at convenient hours.

Provision of adequate financial support for the basic needs of the woman and her family and for her prenatal care is necessary. Recent reports have discussed the adverse effects of financial barriers to prenatal care and the effectiveness of programs to reduce such financial barriers (Office of Technology Assessment 1988; Institute of Medicine 1988).

Lack of adequate transportation is also an important reason why women do not obtain prenatal care. For the woman with children, a long trip on public transportation can be difficult as well as expensive. Little research has been conducted that quantifies the contribution of lack of adequate transportation to the problem of women failing to obtain care. The scheduling of provider services should be in keeping with transportation constraints. Similarly, difficulty in arranging child care may be an impediment to receiving prenatal care. Transportation and child-care barriers may be minimized by providing care in the woman's

immediate community and, for teenagers, in school-based programs. For the woman with little social support, the absence of during-visit child-care assistance may limit her access. Little relevant research has been performed in this area.

SERVICES TO IMPROVE HEALTH-RELATED BEHAVIORS

Programs necessary for care of women at psychosocial risk include those directed at improving health-related behaviors such as alcohol avoidance, illicit drug avoidance, and smoking cessation. Emphasis in prenatal care systems has traditionally focused on medical needs, which have been more easily accepted as part of prenatal care. The Panel believes that more detailed attention should be given to health behavior and that significant improvement in perinatal outcome and family life may derive from health promotion and interventions to reduce psychosocial risks.

Smoking Cessation

Cigarette smoking is associated with and may contribute to many problems, among them early pregnancy loss, premature birth, retarded fetal growth, and sudden infant death syndrome. In populations with higher education levels, at least one-fourth of pregnant smokers will stop on their own by the time of the first prenatal visit. Continuing risk assessment is needed, however, particularly for those at highest risk of resuming smoking—those who had been abstinent for less than one week before the first visit and those who already have had a healthy child. For the 15 to 30 percent of pregnant women who are still smoking cigarettes at the time of their first visit, the research evidence is good that appropriate smoking cessation intervention programs will increase rates of quitting by 12 to 25 percentage points (Sexton and Hebel 1984; Windsor et al. 1985; Ershoff et al. 1989), with corresponding improvements in birthweight (Sexton and Hebel 1984; MacArthur, Newton, and Knox 1988).

Alcohol Avoidance

Consumption of alcoholic beverages during pregnancy is associated with a broad spectrum of adverse pregnancy outcomes. Maternal consumption of alcohol during pregnancy is now the leading somatic cause of mental retardation, surpassing Down

syndrome. Fetal alcohol syndrome (FAS) is the most severe of the live-birth outcomes associated with alcohol abuse. The incidence of FAS in the general U.S. population is 1 to 2 per 1,000 live births; it is 3 to 5 per 1,000 live births among alcoholic women (Abel and Sokol 1986).

There is early epidemiological and animal model evidence that paternal drinking prior to pregnancy may adversely affect sperm production (Abel and Moore 1978) and birthweight (Little and Sing 1984). Heavy drinking by the father may contribute to increased marital stress and family violence.

Response to the problems of alcohol use should include, in addition to primary prevention efforts, use and improvement of methods to identify pregnant women at increased risk of alcohol use, use and improvement of alcohol avoidance counseling, development of effective programs for women needing treatment for alcohol abuse, and provision of support for alcohol abusing women to prevent unwanted pregnancies.

Illicit Drug Avoidance

Drug use among pregnant women is increasing, especially among those who live in urban areas. The National Institute on Drug Abuse has estimated that 10 of every 100 pregnant women in the United States have used or are using cocaine (Jones and Lopez 1990). A survey of 54 urban, suburban, and rural hospitals indicated that, on average, 11 percent of women presenting for prenatal care or delivery had used drugs during their pregnancy (Chasnoff 1988).

The effects of drug use vary with the substance, but it has serious consequences for the objectives of prenatal care. Use of drugs not only can increase the morbidity and mortality of the mother and fetus and affect the long-term health of the child, it also can increase child abuse and neglect and can disrupt family functioning.

Many pregnant women who use illicit drugs during their pregnancy are not addicted and may not be aware of the substantial risk associated with infrequent use. They can be identified by history, and they may respond well to educational messages about risk.

Use of some drugs (crack, for example) is associated with irregular or very late appearance for prenatal care. For the

women who are seen, there often are difficulties in recognizing regular or heavy episodic drug use. Offering drug screening tests to all is recommended. Once chemical dependence is identified, specialized treatment is important. There is, however, a severe shortage of treatment programs, and the programs that are available may not admit pregnant women.

Response to the problems of illicit drug use should include, in addition to primary prevention efforts, development of methods to improve the recognition of illicit drug use by health professionals, AIDS risk-reduction counseling, creation of adequate numbers of effective programs for women needing treatment for their illicit drug use, and provision of support for women to prevent unwanted pregnancies.

OCCUPATIONAL AND ENVIRONMENTAL CONCERNS

Physical, chemical, biological, and psychosocial hazards have been identified in the workplace. The physical hazards include strenuous exertion and prolonged standing during the third trimester (Naeye and Peters 1982). Women in such labor-intensive jobs may be very dependent upon them for economic survival, yet such jobs also may have few pregnancy-related employee benefits. To assist the pregnant woman with work-related risks, the prenatal provider should define the nature of the woman's problem and her options and be able to counsel her if the work-related activity appears detrimental to her health. There is little research on assessment of risk, counseling, and other interventions relating to work settings (Thompson 1990).

SERVICES TO IMPROVE PSYCHOLOGICAL STATUS AND SOCIAL SUPPORT

Women with a variety of psychological problems, including those with chronic mental illness, the institutionalized, those in supervised community living situations, and pregnant teenagers may require special services associated with pregnancy. Some women and couples may be burdened by acute psychological reactions to their life circumstances and the pregnancy. Others may be inadequately prepared for parenting responsibilities. Finally, some women may be at increased risk or current victims of spouse abuse, or their children may be at high risk for neglect or abuse. While these groups of women and families have

many similarities, the skills, interventions, and resources required to improve outcomes may be different. Attention to the functioning of the family unit is stressed in this approach to prenatal care.

Domestic Violence

Pregnant women may be the victims of domestic violence. In most prenatal care settings, these women are not identified and remain in the abusive environment. The prenatal care provider working with an abused woman may need to coordinate the assistance of such diverse agencies as other medical institutions, family and social support agencies, safe shelters, vocational rehabilitation agencies, the police, and legal assistance programs.

Psychiatric Illness

For the pregnant woman with acute psychological difficulties, the prenatal care provider should first detect the problem, be able to assess its dimensions, and either provide appropriate short-term counseling or refer the woman to a treatment resource. The prenatal care provider will need to work closely with support services to manage the woman's pregnancy and to prepare plans for the infant. Prenatal care providers should also work with women with psychiatric illness to identify opportunities to prevent unwanted pregnancies. For women who are also homeless, more aggressive intervention by the prenatal care provider may be needed to identify social service agencies able to help.

Stress and Anxiety

Research is only beginning to define the mechanisms and the effects of stress, anxiety, depression, and severe fatigue on pregnancy. Mechanisms of actions may be direct, mediated by such factors as catecholamines, blood pressure elevations, or altered uterine blood flow; or they may be indirect, affecting the woman's ability to perceive and respond to her physical and emotional needs, including her ability to adhere to prenatal care recommendations. Programs demonstrating effective social support or psychological interventions dealing with stress, anxiety, depression, or maternal self-esteem are evolving (Thompson 1990).

Preparation for Parenthood

Progress has been made in identifying women and families who will have difficulty with parenthood. Marital satisfaction, depression, and self-esteem are related to parenting ability and tend to carry over from the prenatal to the postnatal intervals (Osofsky and Osofsky 1984). Personal characteristics of the parents, their marital relationship, their relationships with others, and the social environment surrounding the family may contribute to parenting adequacy (Martin and Walters 1982). Such influences may be cumulative, suggesting the need for continuing support for families with multiple risks. A number of studies suggest the potential effectiveness of interventions with such high-risk families. Generally such interventions use a regular series of home visits, which are more effective if started prenatally than if delayed until after the birth of the infant.

SERVICES TO IMPROVE NUTRITIONAL STATUS

The *Surgeon General's Report on Nutrition and Health*, chapter 15, has been accepted by the Panel as the basis of its recommendations regarding nutrition. The studies on which the chapter is based showed that well-nourished mothers produced healthier children. These studies found that consumption of sufficient energy and nutrients to attain optimal nutritional status (including appropriate weight before pregnancy and adequate weight gain during pregnancy) improved infant birthweight and reduced infant mortality and morbidity (Worthington-Roberts and Klerman 1990).

An objective of the risk assessment activities noted in the discussion of preconception care and the first pregnancy visit is to identify women at nutritional risk. Such women may include those who are underweight, those who are overweight, those who have specific nutritional deficiencies, those who have eating disorders, those who suffer from chronic illnesses, those who are anemic, those who have short interpregnancy intervals, and those who have had previous infant loss or low birthweight babies. Continuing risk assessment during prenatal care should identify those women who do not gain adequate weight or who develop other nutrition risk factors.

Nutrition risks may be compounded by financial inability to buy appropriate food. The Special Supplemental Food Program for Women, Infants and Children, the Food Stamps Program, the

Commodity Supplemental Food Program, and Aid to Families with Dependent Children are major resources for such women. Unfortunately, these programs do not reach all women and families who need this support. Prenatal care providers should identify and develop relationships with emergency food programs in the community and assess the regularity of food availability. Nutritional supplementation should be available for women identified as being at risk for nutritional deficits.

COMPREHENSIVE SERVICE PROGRAMS FOR PREGNANT TEENAGERS

Comprehensive service programs for pregnant teenagers are important for delivering essential services to a population that is hard to bring into and retain in prenatal care. Such programs have the potential to help teenagers achieve the objectives of prenatal care, by providing, under one roof or through a strong network, comprehensive programs to help teenagers get the prenatal care they need without sacrificing their education. Evaluation of such programs has shown that they are effective in meeting their short-term goals of healthy mothers and healthy infants and in helping mothers finish high school or obtain an equivalency certificate. Improvements in parenting skills and child development were also found. Studies currently under way are evaluating the effect on pregnant adolescents, young mothers, and young fathers of involving male partners, especially those who are still adolescents, in such programs (Klerman 1990).

SUMMARY

Medical and psychosocial risk assessment is a continuing process and is an important component of prenatal care. Based on identification of medical and psychosocial risk factors, patients may be categorized by risk status. Within the risk categories, individualization of prenatal care is required to address the medical or psychosocial risk identified. Interventions to prevent or reduce this risk should take place. An important part of this process is making the patient aware of her need for and her access to health care centers and health care personnel.

Prenatal care includes the recognition of psychosocial risk factors, including social and psychological factors and adverse health habits. Interventions aimed at women with psychosocial needs generally have not received adequate study. The indications for interventions, the effectiveness of different intervention ap-

proaches, and the individualization of interventions all merit investigation. Such interventions, to be effective, need to be linked with preconception care and extended beyond birth.

Psychosocial care should be offered to individuals in high-risk categories or within populations with high-risk designations, and the prenatal care provider should coordinate communication with all agencies involved. Core resources, which should be available for all women at psychosocial risk, include the ability to facilitate assessment of the family and the home environment, continued assessment of evolving psychosocial needs, coordination of treatment services, and supervision of the effects of the services offered to the patient.

Scheduling of prenatal visits should provide ease of access and rapid entry into the system at convenient times, and support for transportation and child care should also be provided when needed.

Services should be offered to improve health behaviors for women and families. These services include smoking-cessation programs; alcohol-avoidance counseling; illicit-drug-avoidance counseling; environmental and occupational assessment; and treatment of acute and chronic psychological problems including illness, violence, stress, and anxiety.

Social support systems include childbirth and parenthood preparation, nutrition counseling and food assistance, educational counseling, and emergency shelter. Home visits for women at high psychosocial or medical risk are recommended, and prenatal care centers should have the personnel to carry out these tasks.

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7

Implications of the Panel's Report

Although the Panel developed this report with objectives for women, infants, and families in mind, it is aware of the implications it has for others such as prenatal care providers, institutions, government agencies (Federal and State) and third-party payers. From the beginning of its deliberations, the Panel was guided by the Hippocratic injunction, *primum non nocere* (first, do no harm). Thus, the Panel was reluctant to suggest changes that might result in a decrease in currently provided prenatal services. In fact, the current standards for obstetric and gynecologic services encompass much of the content of prenatal care recommended in this report (American College of Obstetricians and Gynecologists 1989). Nevertheless, the Panel's analysis of the content of prenatal care resulted in the development of a proposed core visit schedule somewhat different from that in current use. The Panel recognizes that this report is the beginning of a continuing process to define and enrich the components of prenatal care for women who are healthy and also those who are at medical or psychosocial risk. For this process to move forward, gaps in knowledge identified by the Panel must be filled through the support of additional research.

The Panel has reported on the content of prenatal care for healthy women and suggested a core visit schedule. A significant number of women, however, do not fall into this category (Placek and Taffel 1988). The Panel believes that it is imperative that women who enter pregnancy at risk or develop medical or psychosocial risk during pregnancy receive an augmented program of care. This will almost certainly mean more health promotion, risk assessment, and medical or psychosocial interventions provided in more frequent visits. It is generally accepted that treatment should be provided for

medical risk; nonetheless, because of inadequate financing, some women at medical risk are currently not receiving the services they need. In contrast, treatment for women at psychosocial risk is not as widely accepted, and their need for a wide range of health promotion activities and interventions to reduce psychosocial risk is not being met, again largely for financial reasons, but also because the services are simply not available. Thus, the Panel recognizes that some changes in current practice and in public policies will be necessary to implement its recommendations.

IMPLICATIONS FOR PRENATAL CARE PROVIDERS

The basic relationship between the woman and her prenatal care provider is not changed by this report. Professional evaluation and judgment, structured longitudinally and employing ongoing risk assessment and health promotion, must continue. No distinction is made or suggested between care provided in the public versus the private sector.

Introducing flexibility in scheduling and content to reflect risk assessment and parity and to incorporate strong emphasis on preconception care will require some adjustments in practice. These adjustments should result in a more comprehensive and effective approach adapted to meet the needs of the individual woman. The report emphasizes giving attention to psychosocial risk and health promotion. The Panel's suggestions for care are within the capability of existing practices and clinics. As additional knowledge is generated by research, more adjustments can be anticipated.

CHANGES IN PUBLIC POLICIES

The services that the Panel has recommended need to be provided to all women, regardless of their economic status. Although a review of the financing of services was not included in the Panel's charge, other reports have made it clear that economic barriers prevent many women from obtaining the most rudimentary forms of prenatal care and that, even when care is paid for by private insurance or Medicaid—or even when it is free—the service package may be limited (Institute of Medicine 1988; Office of Technology Assessment 1988). The Panel urges an expansion of Medicaid to cover more pregnant women or the

development of alternative financing programs, to eliminate economic barriers to women's receiving the full range of services. The cost-effectiveness of such measures has been demonstrated.

The Panel is aware that the services it is recommending are not available in many parts of the country. It believes that it is the responsibility of Federal and State governments to make essential services accessible to their citizens. If funds are appropriated to pay for these services, the Panel believes that providers will respond by expanding availability.

The Panel has recommended that a large number of special programs be offered to women, particularly those at psychosocial risk. These include regularly scheduled home visits; programs aimed at eliminating smoking, alcohol consumption, and illicit drug use; preparation-for-childbirth classes; and comprehensive service programs for pregnant teenagers. In each case, the Panel has reviewed the evidence and believes that the programs are effective in that they can help reach the objectives of prenatal care and that in many cases they are also cost-effective, i.e. the programs will cost less than the cost of care for sick mothers, sick infants, or sick families. Coverage for these programs should be available under private insurance policies and Medicaid, and they should be provided in Health Maintenance Organizations and in the facilities often used by those of low income: community health centers, health department clinics, and hospital ambulatory care centers. The Panel notes that these programs are often available in clinic settings and urges similar availability in private settings.

RESEARCH

The Panel's initial charge—to report on the content and timing of prenatal care—presented serious difficulties because of the paucity of research on many aspects of prenatal care. Some prenatal care practices were judged to be appropriate even though effectiveness had not been formally studied. For example, the Panel had little or no data on the value of routine physical examinations at the first visit. Because the Panel could not perform research, it used its collective judgment. Similarly, the Panel recommends enriching the content and reducing the number of prenatal care visits for the healthy parous woman. This decision also was based on judgment, because too few clinical studies were available for review.

The Panel strongly supports comprehensive research related to the content of prenatal care. The present is an appropriate time for this recommendation to be implemented because of (1) heightened recognition of the needs and benefits of prenatal care (Office of Technology Assessment 1988; Institute of Medicine 1988) and (2) broadened approaches to research methodology (Chalmers et al. 1989). Needs and benefits of perinatal research, especially that related to the prenatal period, have been pointed out by reports devoted to the problems of infant mortality and low birthweight. These reports recognize that a societal initiative must be undertaken. Concurrently, advanced research methodology uses the new technology of computerized data management and analysis. Perinatal researchers are refining the techniques of randomized controlled trials, and there is much interest in outcome research. All research methodologies can and should be employed, but randomized controlled trials and outcome research have special potential for contributing to content and quality of prenatal care.

There is an urgent need for the Public Health Service and private organizations to recognize and support not only studies of the etiology, diagnosis, treatment, and prevention of medical risk, but also of risk assessment, health promotion, and intervention to prevent psychosocial problems.

There was an absence of research on (1) the effect of intervention in the prenatal period on the psychosocial objectives of prenatal care, (2) the effectiveness of a preconception visit, (3) the effectiveness of widely recommended risk assessment procedures, and (4) the effectiveness of psychosocial interventions. Many of the recommendations made in chapter 4 for risk assessment, health promotion, and intervention to reduce psychosocial risk are based on relatively weak evidence; these are areas in which additional research is most needed.

Many of the objectives of prenatal care listed in chapter 1 are traditional, for example, preventing maternal and infant mortality and morbidity. Other suggested objectives have not yet been as widely accepted: reducing unwanted pregnancies, increasing the use of primary health care, reducing child abuse and neglect, and improving parenting skills. The potential effects of integrating services with these objectives into the prenatal care package have not been well explored. There is an urgent need for such research.

Preconception Visit

The Panel strongly recommends a preconception visit for all women. It is logical to anticipate that the correction of conditions prior to conception would improve the outcome of pregnancy. Scientific evidence exists in the area of medical illness. The severely ill woman may be better treated prior to pregnancy; this treatment will affect the pregnancy outcome. Many improvements in patient risk status will require continuing preconception care rather than a single visit. There is a need to further determine the effectiveness of the preconception visit and the appropriate mix of risk assessment, health promotion, and intervention activities to achieve the objectives of prenatal care. Thus, although the Panel strongly supports the preconception visit in today's health care activities, it also strongly supports studies evaluating the effectiveness of preconception care.

Risk Assessment Activities and Systems

Prenatal risk assessment activities, described earlier, need further study. Accepted procedures, such as the general patient examination, the large number of laboratory tests, and the timing of prenatal care, all need study. Although the Panel strongly supports risk assessment, studies are needed that will further refine the process and specify which activities are most effective and when they should be implemented.

Risk assessment activities have been used to identify and guide the treatment of illness. These data-collection activities originated in history taking or patient questioning and have been formalized as risk assessment systems designed specifically for prenatal care. The many data-collection systems in use today need testing to see if one system can be determined to be superior and if it should become a standard. A single system common to all prenatal care has unique data collection and patient study advantages.

Health Promotion Activities

Health promotion has been emphasized in this report and made an important part of preconception and early pregnancy care. This expanded concept of health promotion has a high priority for research. The research needs for each defined health promotion activity are presented below.

Counseling to Promote and Support Healthful Behavior. There is a high priority for research on counseling techniques that are successful in teaching women to avoid known teratogens and implement safer sex practices. In addition, the Panel recommends more study of effective methods of teaching early symptom recognition in preterm labor. When additional data are available relating to environmental effects and job requirements which increase the risk of poor outcomes of pregnancy, studies should be undertaken to improve counseling of women about work patterns and needed changes throughout pregnancy in a variety of jobs.

General Knowledge of Pregnancy and Parenting. Many elements of pregnancy and parenting knowledge have been shared with women and pregnant families for centuries. Very few have been studied in a rigorous manner, either for content of what is shared or the most effective teaching strategies to be used. The Panel has identified knowledge of physiological, emotional, and sexual behavior changes throughout pregnancy and fetal growth and development as needing additional research. In addition, the Panel set a high priority for research on the effectiveness of teaching women self-help strategies for common discomforts, on culturally appropriate methods of promoting breastfeeding during prenatal contacts, on methods of instruction about infant car seat safety, on continued exploration of the specific content and teaching methods used during prepared childbirth education classes, and new studies of how providers might begin parenting instruction effectively during prenatal care.

Information on Proposed Care. Though there has been little formal study of general sharing of information about proposed care during prenatal contacts, the Panel deemed this well accepted and practiced. This activity, however, would be strengthened through the conduct of research studies on its content.

Interventions to Reduce Psychosocial Risk

Those interventions that address substance abuse counseling and referral to treatment programs, food assistance and referral, program of home visits, social and financial resources, and other referrals should be the subject of research to determine and increase their effectiveness.

Chronology of Prenatal Care Visits

For healthy women, the Panel recommends fewer contacts and visits than current practice; the value of this change needs to be confirmed. Prenatal care providers have long felt that, even for healthy women, something undefined about the support provided through regular contacts is important in improving the outcome of pregnancy. For all women, the content and number of visits with prenatal care providers requires study utilizing randomized controlled trials and other methodologies.

Medical Risk

Preeclampsia. Early models of prenatal care, both in content and timing, were, for the most part, based on the desire to prevent medical risk; the need for change has already been described. Although preeclampsia and accompanying hypertension strongly contribute to fetal and maternal morbidity and mortality, screening methods and the timing of prenatal visits are not yet clear for this illness. Additional studies are needed to determine which factors predict risk, when the risks may be ascertained, and what procedures or tests will predict effectively or document the presence of preeclampsia and hypertension (Harrison 1990).

Infection. Many infections are health hazards for mother, fetus, and family. The entire spectrum of infections for which the timing and content of prenatal care visits may be altered is beyond the scope of this report. Although any infection may negatively affect a pregnancy, two sexually transmitted infections are mentioned.

The relationship of infection to the etiology of preterm labor and membrane rupture is hypothesized and as yet poorly understood. Nevertheless, guidelines based on research are needed for timing patient visits, screening for potential infections, and treating identified risk factors. If infection is a harbinger of prematurity and of perinatal and maternal morbidity, surveillance systems are needed to identify and treat illnesses before their effects take place. Identification and treatment during preconception, when the fetus will not be harmed, is particularly important (Whitley and Goldenberg 1990).

Gonorrhea. The relationship of premature rupture of the membranes and neonatal infection needs further study. The timing for initial and later screens needs to be evaluated. Can

risk populations be identified? When and how often should screening take place in high-risk and low-risk populations?

AIDS. The human immunodeficiency virus (HIV) infection, from asymptomatic infection to clinical AIDS, needs major study in women and their infants. To date, epidemiologic research on the seroprevalence of HIV infection has focused on delineating the groups of women and infants at risk for HIV infection. Clinical research about the cause of HIV and cofactors for transmission of HIV from mothers to infants is under way. The effect of HIV infection on pregnancy outcome and the effect of pregnancy on progression of HIV infection to AIDS is currently being investigated. The role of antiretroviral agents and other therapeutic treatments to prevent transmission from mother to infant requires clinical research. Screening pregnant women and their infants remains important in documenting the extent of this epidemic, although defining the populations to be screened and providing appropriate counseling for these women warrants special consideration. Research continues to investigate ways to prevent heterosexual spread of this disease.

Intrauterine Growth Retardation. The problem of inadequate fetal supply or processes that lead to impoverished fetal growth is known as intrauterine growth retardation (IUGR); separate growth patterns may occur throughout pregnancy. Growth deprivation often leads to perinatal and infant morbidity and mortality. Studies are needed to develop methods for identifying fetuses at risk for IUGR and for treating IUGR once it has been identified. The intergenerational effects of IUGR are not well understood. Maternal behaviors, such as drug, alcohol, and tobacco abuse, as well as environmental factors such as nutrition and food supplementation, maternal exercise, anxiety, and job activity, should be examined for their effects on fetal supply and growth. Other behaviors also may affect normal fetal growth (Goldenberg 1990).

Diagnosis and Treatment of Genetic and Congenital Disorders. This is an important area for study and one that has excellent potential for decreasing infant mortality and morbidity. Studies are needed of the efficacy and safety of chorionic villus sampling from vaginal as well as abdominal routes and the appropriateness of early amniocentesis. Percutaneous umbilical cord and fetal sampling for developmental abnormalities, diagnosis of illness, or the assessment of fetal health in the presence, for example, of infection or asphyxia, needs further review. Indications for the use of ultrasound require additional study. Although routine ultrasound use for all patients is not recom-

mended in this report, prospective studies are needed of this procedure.

The efficacy of preconception counseling for genetic disorders should be examined, as should preconception treatment with folic acid to prevent neural tube defects. The effects of preconception treatment of diabetes to prevent fetal defects are still not clear. The treatment of fetal genetic disorders needs careful examination. Fetal therapy for disease prevention needs study. Environmental teratology also needs study related to the biology of diseases and study of effective patient education (Hogge 1990).

Preterm Birth. Identification of the causes of preterm birth will allow appropriate prenatal and preconception interventions to be designed. As yet, knowledge is inadequate regarding the onset of normal labor, the etiologies of premature labor, or the treatments for the varied causes of premature labor. The value of present monitoring and counseling systems must be understood before new technologies become a part of prenatal care. All of these are critical areas for study (Klein and Goldenberg 1990).

Postterm Birth. Some fetuses outgrow their placental support systems and are at increased risk for mortality and morbidity during the gestational period beyond 41 weeks. Studies are needed to document more adequately how fetal age correlates with the adequacy of fetal supply. Antepartum techniques for monitoring fetal health are still limited and require further study to determine their effectiveness. New measures for identifying the at-risk mother and fetus are needed (Fox 1990).

Diabetes. Diabetes has become a serious burden in prenatal care. The adequacy of methods for prospective identification of the gestational diabetic or of the unrecognized diabetic needs further study. The use of standardized screening tests for all low-risk patients has been suggested, although it is realized that the sensitivity and specificity of the tests need to be improved (Langer 1990).

Psychosocial Risk

Work and Pregnancy. The effect of work and of occupation on pregnancy needs study, especially in a society in which women's career and occupational roles are continually expanding. The effects of toxins, physical exertion, psychological stress, and

anxiety may limit the attainment of the objectives of prenatal care. What risks do various occupations pose for maternal and fetal systems? Individual occupational hazards need to be identified and analyzed before adequate preconception and prenatal counseling can take place. In addition, the effects of interventions need to be determined (Culpepper and Thompson 1990).

Stress, the Home Environment, and Pregnancy. The home environment and its effect on a woman and her fetus may have an important effect on prematurity, growth deprivation, mortality, and morbidity. Theoretical models for study and later testing of interventions to reduce stress in the home environment to improve outcome for mother, fetus, and family are needed. Risk situations need to be more readily recognized, and screening tools for predicting pathologic levels of anxiety and stress for women with little social support are needed. It is important to develop intervention models and to document their effectiveness in known risk environments to reduce anxiety and tension and improve fetal outcomes (Thompson 1990).

Nutrition and Pregnancy. Knowledge relating to nutritional screening and counseling is deficient. The Panel recommends studies to identify the nutritionally deprived mother and family and supports the concept of home visits for both nutritional screening and intervention. Available data support food supplementation, but more studies are needed in the areas of risk identification, patient education, and specific interventions and their effects on perinatal mortality and morbidity (Worthington-Roberts and Klerman 1990).

Intervention to Reduce Psychosocial Risk. In this important new component of prenatal care, there is a great need for additional research. Substance abuse counseling and referral to treatment programs, nutrition supplementation or referral, home visit programs, and other services would be strengthened by additional studies, although particular emphasis needs to be placed on investigations to determine and improve the efficacy of substance abuse counseling and treatment, nutrition supplementation, and home visiting.

THE FUTURE OF PRENATAL CARE

To continue the process of refining the content of prenatal care to meet the objectives for the pregnant woman, the infant, and the family, changes in public policy and prenatal-care-provider

delivery of health services must take place. Equally important, additional research must be undertaken. The Panel realizes that its job is not completed; its members are ready to assist in the interpretation and implementation of its recommendations. The future of prenatal care—its changes, its improvements, and its availability for all women—does not rest on this report. Rather, it devolves to society and its willingness to devote new resources to this most important concern.

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Appendix A

Criteria for Evaluating Evidence on the Effectiveness of Prenatal Interventions

INTRODUCTION

Prior to beginning its assessment of information relating to the content, frequency, and timing of prenatal care, the Panel developed a process to assess information, data, and studies. The standards that follow were used. The caveat the Panel offers at this time is that often data were lacking or studies were limited in value; therefore, the Panel's judgments were based on this process, when possible.

The interventions in use in prenatal care were categorized into those that had been studied and those that had not. Those that had been studied were categorized into (1) measures that are effective for all pregnant women; (2) measures that are effective, but only for a subset of women who are at risk; and (3) measures that are not effective. Deciding which of these categories was appropriate for a specific measure required a careful weighing of the evidence.

It is widely accepted that the evidence from a well-conducted randomized clinical trial is the most convincing demonstration of effectiveness of a health intervention. However, such trials are not always feasible, and much of medical practice today has not been subject to such clinical trials. Much of the supporting evidence for current practice has been obtained from well-conducted, nonrandomized, observational studies. It was a major challenge to establish criteria for evaluating the strength of the evidence from such studies.

Evaluating the evidence and making appropriate recommendations was a four-stage process:

1. categorizing the evidence by the quality of its source;
2. evaluating the evidence of a causal relationship between the activity and its objective;
3. assessing the overall quality and strength of the evidence; and
4. formulating the Panel's recommendations.

In implementing policy, factors other than degree of effectiveness or association came into play, including considerations of cost, patient acceptability, risk–benefit ratio, and the relationship of interventions to each other.

As stated frequently in this report, decisions were based on available information. In chapter 7, the Panel, in its recommendations, expresses strong feelings about the need for appropriate evidence prior to clinical implementation.

PROCESS FOR USING THE EVIDENCE IN DEVELOPING RECOMMENDATIONS

Categorizing the Evidence by its Source

The categories of evidence used by the U.S. Preventive Services Task Force and the Canadian Task Force on the Periodic Health Examination were modified as follows for use in evaluating the scientific data available for documenting the efficacy of prenatal care activities.

1. **Trials** (planned activities with contemporaneous assignment of treatment and nontreatment)
    a. Randomized, double blind, placebo controlled with sufficient power, appropriately analyzed
    b. Randomized, but blindness not achieved
    c. Nonrandomized trials with good control of confounding, and in other respects well conducted
    d. Randomized, but with deficiencies in execution or analysis (insufficient power, major losses to followup, suspect randomization, analysis with exclusions, etc.)

e. Nonrandomized trials with deficiencies in execution or analysis

2. **Cohort or case-control studies**

   a. Hypothesis specified prior to analysis, good data, confounders accounted for
   b. As above, but hypothesis not specified prior to analysis
   c. Posthoc, with problem(s) in the data or the analysis

3. **Time series studies**

   a. Analyses that take confounding into account
   b. Analyses that do not consider confounding

4. **Case-series studies**

   Series of case reports without any specific comparison group

Among other issues that must be considered in reviewing the evidence are the precision of definition of the outcome being measured, the degree to which the study methodology has been described, adequacy of the sample size, and the degree to which the characteristics of the population studied and the activity being evaluated have been described.

A study can be well designed and carried out in an exemplary fashion (internal validity), but if the population studied is an unusual or highly selected one or the intervention differs from that generally applied in prenatal care, the results may not be generalizable (external validity). That is, there may be good internal validity but very limited external validity. At times, a study may evaluate a measure in a highly controlled "laboratory" setting (efficacy of the measure) that may have limited relevance to actual real world conditions and populations (effectiveness of the measure). Studies may therefore be categorized as being probably applicable or as having only narrowly limited generalizability since they were based on studies of highly selected populations.

Guidelines for Evaluating the Evidence of a Causal Relationship

Major Criteria. The Criteria for Causation used in the report of the Surgeon General's Committee (1964) were modified for use in assessing the effectiveness of interventions. These guidelines were generally used to weigh the evidence from a series of studies (where more than one study is available).

Temporal Relationship. An activity can be considered evidence of a reduction in risk of disease or abnormality only if the activity was applied prior to the time the disease or abnormality would have developed. It is therefore essential that the information needed to assess this temporal relationship be available in the report of the study.

Biologic Plausibility. If an activity is believed to have a specific effect, there should be a biologically plausible mechanism explaining why such a relationship would be expected to occur.

Consistency. Single studies are rarely definitive. Study findings that are replicated in different populations and by different investigators carry more weight than those that are not. If the findings of studies are inconsistent, the inconsistency must be explained, and if the findings from one or several studies are accepted, but those from others are not, the rationale for so doing must be presented.

Alternative Explanations (Confounding). For many hypothesized causal relationships, other explanations are available for the relationships found. The extent to which such alternative explanations have been explored is an important criterion in judging causality. Alternative hypotheses invoke so-called "confounding" variables whose effectiveness ought to be controlled in the design or analysis of a study.

Other Considerations. Other factors that may be relevant in weighing the strength or quality of the effectiveness of an activity include the following:

Dose-Response Relationship. If a factor is indeed the cause of a disease, usually (but not invariably) the greater the exposure to the factor, the greater the risk of the disease. Similarly, one might expect that if a factor or activity is the cause of a reduction in disease risk, the greater the "exposure" to the activity, the greater the reduction in risk will be. Such a

dose–response relationship may not always be seen, since many important biologic relationships are dichotomous with a threshold level for observed effects.

Strength of the Association. The strength of the association is an important criterion for disease causation and is usually measured by the extent to which the relative risk or odds depart from unity, either above 1 (in the case of disease-causing exposures) or below 1 (in the case of preventive activities). Statistical methods should be applied to determine whether the observed relative risk differs significantly from 1 and to calculate confidence intervals showing the likely range of the magnitude of the association.

Cessation Effects. If an activity has a beneficial effect, then the benefit should cease when it is removed from a population, unless there is a carryover effect.

Biases Specific for the Study of Birth Outcome and Prenatal Care. A number of biases, which may not be unique to this area, are major concerns in studying the relationship of prenatal care to birth outcome, specifically, to prematurity and low birthweight.

1. Since mothers delivering prematurely will, of necessity, make fewer prenatal visits, the result is an artifactual relationship between fewer prenatal visits and risk of preterm delivery.

2. Women who begin their care late in the third trimester of pregnancy cannot have a preterm delivery. This artificially lowers the association between late onset of prenatal care (therefore also fewer prenatal visits) and risk of preterm delivery.

3. Patients with medical or psychosocial complications of pregnancy may have more prenatal visits. The result is a reduction in the estimated risk associated with fewer prenatal visits.

4. Patients with adverse outcomes in prior pregnancies may also have more prenatal visits scheduled so that the estimated risk associated with fewer prenatal visits may again be reduced.

5. A strong bias is associated with self-selection for early prenatal care. Women who seek prenatal care earlier in pregnancy are generally better educated, from higher

socioeconomic status, and have more positive attitudes toward health care. Thus, a population of women, who are to begin with at lower risk for an adverse birth outcome, select themselves for earlier prenatal care. The result is a potential for an association of early prenatal care with lower risk of adverse pregnancy outcome, even if the care itself is without any health benefit.

Special Considerations in Evaluating Vital Data. Vital statistics play an invaluable role in the evaluation of maternal and child health programs. They are unique in providing relatively complete coverage of the U.S. population, large numbers of events, and reasonably comparable data over long periods of time. Nevertheless, there are certain issues to be considered when evaluating the strength and quality of evidence from studies based on birth and death certificates.

Registration Completeness. Although registration of live births that survive the neonatal period is virtually 100 percent, questions have been raised regarding the completeness of registration for infants who die shortly after birth, for fetal deaths, and geographic variations in completeness of registration.

Completeness of Items on Birth Certificate. In general, item nonresponse on birth certificates is fairly low—less than 5 percent. However, item nonresponse tends to be higher among high-risk births, leading to potential bias. If records with unknown data are omitted from an analysis, results could be biased.

Quality of Data. Comparison of birth certificate data with other sources indicates certain problem areas, including information on gestation. For example, studies that have compared interview data with vital statistics indicate that the woman's self-report of the month in which prenatal care began tends to be earlier than stated on the birth certificate. Part of this difference may be due to the woman having multiple sources of care while the hospital record (upon which the birth certificate is usually based) reports the date of first visit made to the last source of care.

Content of Prenatal Care. Although most birth certificates include information on the month in which prenatal care began and the total number of prenatal visits, most certificates do not include any information on the content of prenatal care or the precise timing of the visits; thus, it is usually impossible to use vital statistics to evaluate specific activities of prenatal care.

Assessing the Overall Quality and Strength of the Evidence

Direct Evidence of Effectiveness of an Activity. Five levels of the quality and strength of the evidence, adapted and modified from the Canadian Task Force, are proposed: good or fair evidence of effectiveness, poor or insufficient evidence of effectiveness, and fair or good evidence of no effectiveness. For each prenatal care activity considered, each assessment could be applicable for a target (high-risk) population, but not for routine across-the-board prenatal care; or each assessment might be applicable as a general standard of routine prenatal care.

If the activity has been studied, the evidence can be weighed. If it has not been studied, a recommendation should be made as to whether the measure should or should not be instituted (or continued, if already in practice) pending an appropriate study. Each activity also needs to be considered in terms of its benefits, side effects, costs, and the feasibility of applying it in the actual clinical setting.

Presumptive Evidence of Effectiveness of an Activity. In the special case of risk factors that fulfill the following four criteria, activity to remove the risk factor may be presumed effective, even in the absence of a trial documenting effectiveness.

1. The risk factor is known to be causally related to a specific and very serious effect that is commonly found when the risk factor is present.

2. The risk factor is easily removable by simple avoidance of it by the mother.

3. There is no strong reason to believe that women would resist avoiding the risk factor.

4. Removal of the risk factor is without known hazard.

For example, accutane and thalidomide cause very serious birth defects in a substantial proportion of exposed fetuses. These defects can be prevented by simple avoidance of ingestion of these medications. Most mothers informed of the high risk of birth defects with use of these medications are not likely to refuse to avoid their use. Nonuse of accutane or thalidomide is unlikely to be harmful. Therefore, counseling to avoid these

drugs can be presumed effective even in the absence of a trial showing that their avoidance reduces birth defects.

In contrast, smoking has an effect on the fetus that is comparatively modest (though definite), and, although in principle easily avoidable, avoidance may be difficult to achieve because of the addictive properties of cigarettes. Thus we cannot presume a priori that counseling women to avoid smoking is effective in increasing birthweight in the absence of a trial showing this effect.

Presumptive evidence of the sort described in this section is not as convincing as the results of a well-conducted randomized trial demonstrating effectiveness, but randomized trials are unlikely to be done to demonstrate the value of avoiding highly toxic exposures.

Formulation of the Panel's Recommendations

Recommendations for the content of prenatal care have been formulated by the Panel using the above guidelines. In some cases, where evidence has been insufficient, the Panel has reviewed the issue and made recommendations based on its collective judgment. The basis for each recommendation is given together with the recommendation itself. In some cases, the evidence supporting a recommendation also suggests what the most appropriate timing may be in the sequence of prenatal care. In most cases, however, such evidence is lacking. In these instances, the Panel used its judgment as to the most appropriate time for the activity. Two factors used in this judgment were the temporal relationship of the activity to the pathogenic sequence to be prevented or interrupted and considerations of efficiency and feasibility.

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Appendix B

Master List of Specific Components in the Content of Prenatal Care

This master list reflects the three components of prenatal care (risk assessment, health promotion, and intervention) and the specific content (activities) of prenatal visits and contacts. This division enabled the Panel to evaluate the evidence for each activity and recommend whether that activity should or should not continue as a part of prenatal care. This listing of content does not discuss appropriate timing other than to distinguish between the content of an initial pregnancy evaluation and that of routine revisits throughout pregnancy for healthy women. The goals of these prenatal care activities are health assessment, health promotion, and detection of risk factors or disease that could negatively affect the outcomes of pregnancy for the woman, fetus, infant, and family. When significant medical or psychosocial risks appear, additional activities, commonly called treatment, are needed. Those treatment modalities are not the focus of this report.

The history, laboratory, and health promotion sections of this list are more detailed than the physical examination and intervention sections. Historical details are needed to assess health and risk status as well as to guide the examiner during the physical examination. Because many laboratory tests have become "routine," each was examined; those included reflect the evidence and collective judgment of the Panel members. Health promotion and psychosocial intervention activities, including many education and counseling topics, are new for many providers and therefore are listed in greater detail.

A. PRECONCEPTION OR FIRST PREGNANCY VISIT

Risk Assessment Activities

A.1 History

A.1.1 Sociodemographic

a. Age
b. Marital status
c. Income and educational level
d. Household size, geographic location
e. Level of financial resources for pregnancy
f. Nature of support network for pregnant woman and family

A.1.2 Psychological

a. Major life events and stressors
b. Extremes of maternal stress and anxiety
c. Abuse or family violence
d. Mental status and illness
e. Readiness for pregnancy

A.1.3 Menstrual/gynecologic

a. Onset, duration, frequency, and character of menses
b. Last menstrual period (LMP) and last normal menstrual period (LNMP)
c. Infections such as pelvic inflammatory disease (PID)
d. Gynecologic surgery

A.1.4 Contraceptive and sexual

a. Planned pregnancy, wantedness
b. Contraceptive methods used
c. Current sexual relationship, partners

A.1.5 Past obstetric

a. Prior pregnancies, length and timing
b. Previous intrauterine growth retardation (IUGR) infant or preterm birth
c. High parity, short birth interval

d. Previous hemorrhage
e. Stillborn or neonatal death
f. Sudden infant death syndrome (SIDS) infant

A.1.6 Medical and surgical

a. Chronic diseases, e.g. diabetes, hypertension, anemias
b. Prescription medications
c. Infections, e.g. human immunodeficiency virus (HIV), hepatitis, toxoplasmosis
d. Allergies
e. Trauma
f. Surgical procedures
g. Blood transfusions

A.1.7 Genetic—individual, spouse, and family

a. Repeated spontaneous abortions
b. Chromosomal and other congenital abnormalities
c. Hemoglobinopathies, e.g. sickle cell anemia
d. Radiation and other toxic substance exposure
e. Multiple births
f. Family history of chronic diseases

A.1.8 Nutrition

a. Prepregnancy weight (height to weight profile)
b. Diet history with evaluation of adequacy
c. Barriers to adequate nutrition intake, e.g. financial, cultural, food fads, pica
d. Special dietary patterns, e.g. vegetarian, lactose intolerance, caffeine, NutraSweet®

A.1.9 Behavioral

a. Smoking, alcohol, illicit drug use
b. Over-the-counter medications, prescription drugs
c. Rest and sleep patterns
d. Extremes of exercise or physical exertion
e. Dental care

A.1.10 Environmental hazards, work hazards, or both

a. Exposure to toxins, teratogens
b. Work—occupation, type and level of activity

A.1.11 Current pregnancy to date (first visit)

a. Normal signs and symptoms
b. LMP and LNMP
c. Estimated date of conception, weeks gestation at present time
d. Abnormal signs and symptoms, concerns

A.2 Physical Examination

A.2.1 General appearance and nutrition

A.2.2 Blood pressure, pulse

A.2.3 Height to weight profile, present weight

A.2.4 Head and neck

A.2.5 Heart and lungs

A.2.6 Breasts

A.2.7 Abdomen

A.2.8 Pelvic area tenderness

A.2.9 Extremities and back

A.2.10 Neuromuscular

A.2.11 Pelvic evaluation:

a. Speculum examination
b. Bimanual examination
c. Clinical pelvimetry

A.3 Laboratory Tests

A.3.1 Hemoglobin or hematocrit

A.3.2 Blood Rh, Rh negative titer, antibody screen

A.3.3 Rubella titer (if immunity not previously documented)

A.3.4 Serology

A.3.5 Pap smear

A.3.6 Urine protein and glucose

A.3.7 Urine screen for urinary tract infection (UTI), kidney disease

A.3.8 Gonorrheal smear

A.3.9 Hepatitis B titer

A.3.10 Screening tests offered to all women:

a. HIV titer
b. Drug toxicology

A.3.11 Screening tests in endemic areas or for women with risk factors:

a. Toxoplasmosis, tuberculosis
b. Herpes simplex, varicella
c. Chlamydia
d. Hemoglobinopathies
e. Tay Sachs

A.4 Fetal Evaluation

A.4.1 Confirm gestational age (LMP, uterine size)

A.4.2 Auscultation of fetal heart after 8 weeks

Health Promotion Activities

A.5 Counseling to Promote and Support Healthful Behaviors

A.5.1 Nutrition

A.5.2 Smoking cessation

A.5.3 Avoidance of alcohol

A.5.4 Avoidance of illicit drugs

A.5.5 Avoidance of teratogens

A.5.6 Safer sex

A.6 General Knowledge of Pregnancy and Parenting (First Visit)

A.6.1 Physiologic and emotional changes of pregnancy

A.6.2 Sexuality counseling

A.6.3 Fetal growth and development

A.6.4 Self-help strategies for common discomforts

A.6.5 Early pregnancy classes

a. Nutrition
b. Physiologic changes
c. Psychological adaptation
d. Exercise for fitness

A.7 Information on Proposed Care

A.7.1 Need for early entry into prenatal care

A.7.2 Preparation for screening and diagnostic tests

A.7.3 Content and timing of prenatal visits needed (first visit)

A.7.4 Need to report danger signs immediately (first visit)

Interventions to Reduce Psychosocial Risk

A.8 Substance Abuse Counseling and Referral to Other Programs

A.8.1 Smoking cessation

A.8.2 Alcohol avoidance

A.8.3 Illicit drug avoidance

A.9 Nutrition Supplementation and Referral

A.9.1 Counseling to improve adequacy of diet

A.9.2 Vitamin and iron supplementation on indication

A.9.3 Supplemental food programs, e.g. WIC

A.10 Program of Home Visits

A.10.1 Need for home visits identified

A.10.2 Type and timing of home visit needed

A.11 Social and Financial Resources

A.11.1 Enrollment in medical assistance program on indication

A.11.2 Assistance with housing on indication

A.11.3 Referrals for social support, counseling, etc.

A.12 Other Referrals

A.12.1 Home health agency

A.12.2 Community mental health center

A.12.3 Safe shelter

Interventions to Reduce Medical Risk

A.13 Treatment of Existing Illness

A.14 Referral and Consultation with Other Specialized Providers as Indicated

A.14.1 Medical—internist, surgeon, etc.

A.14.2 Genetic counselor

A.14.3 Dentist

A.14.4 Home health agency, community health nurse

A.14.5 Maternal or fetal specialist

A.14.6 Pediatrician

B. ROUTINE PRENATAL REVISIT

Risk Assessment Activities

B.1 History

B.1.1 Pregnancy history to date

a. Support network
b. Coping and stress levels
c. Nutrition
d. Behavioral changes, e.g. smoking cessation, alcohol and other substance abuse reduction, exercise
e. Common discomforts

B.1.2 Problems or danger signs since last visit

a. Vaginal bleeding
b. Signs or symptoms of PIH
c. Infections, e.g. UTI symptoms
d. Uterine contractions

B.1.3 Ability to follow recommendations or treatments

B.2 Physical Examination

B.2.1 General appearance and nutrition

B.2.2 Blood pressure

B.2.3 Weight, including pattern of weight gain

B.2.4 Abdominal assessment (see fetal evaluation)

B.2.5 Cervical check after 40 weeks

B.3 Laboratory Tests

B.3.1 Maternal serum alpha-fetoprotein (14–16 weeks gestation)

B.3.2 Repeat hematocrit or hemoglobin (26–28 weeks gestation)

B.3.3 Diabetes screen (26–28 weeks gestation)

B.3.4 Serology (3rd trimester)

B.3.5 Other tests on indication

B.4 Evaluation of Fetal Well-Being

B.4.1 Confirm gestational age, e.g. dating, LNMP, size

B.4.2 Fundal height measurements for fetal growth

B.4.3 Auscultation of fetal heart rate

B.4.4 Fetal lie, position, presentation, weight as term approaches

B.4.5 Tests of fetal well-being (on indication)

B.5 Counseling to Promote and Support Healthful Behaviors

B.5.1 Nutrition

B.5.2 Avoidance of teratogens

B.5.3 Maternal seatbelt use

B.5.4 Safer sex

B.5.5 Support for smoking cessation

B.5.6 Work counseling

a. Stress reduction strategies
b. Avoidance of heavy lifting, long standing
c. Indications for cessation of work

B.6 General Knowledge of Pregnancy and Parenting

B.6.1 Physiologic and emotional changes of pregnancy

B.6.2 Sexuality counseling

B.6.3 Fetal growth and development, activity patterns

B.6.4 General health habits

a. Hygiene
b. Exercise and muscle toning
c. Rest and sleep patterns

B.6.5 Self-help strategies for common discomforts

B.6.6 Promotion of breastfeeding

B.6.7 Infant car seat safety

B.6.8 Preparation-for-childbirth classes

a. Anatomy and physiology of labor and birth
b. Training in conditioned responses to pain or discomfort
c. Training of labor support person(s)

d. Preparation for unexpected outcomes, e.g. cesarean delivery
e. Postpartum recovery
f. Infant care and feeding

B.6.9 Preparation-for-parenting classes

a. Infant needs, growth, and development
b. Needs of new parents and role changes
c. Parenting skills
d. Effect of newborn on adult lifestyles
e. Effect of newborn on siblings

B.6.10 Encourage questions about labor and birth process

B.6.11 Infant care review

B.6.12 Family roles and adjustment review

B.7 Information on Proposed Care

B.7.1 Pattern and Content of Visits

B.7.2 Laboratory tests

B.7.3 Need to report danger signs

B.7.4 Signs and symptoms of preterm labor

B.7.5 Birth plan, expectations, and goals

B.7.6 When and where to go in labor

Interventions to Reduce Psychosocial Risk

B.8 Substance Abuse Counseling and Referral to Treatment Programs

B.8.1 Smoking cessation

B.8.2 Alcohol avoidance

B.8.3 Illicit drug avoidance

B.9. Nutrition Supplementation and Referral

B.9.1 Counseling to improve adequacy of diet

B.9.2 Vitamin and iron supplementation on indication

B.9.3 Supplemental food program on indication

B.10 Program of Home Visits

B.10.1 Decision on need for home visits, e.g. medical disease, poor health habits, history of family violence, age

B.10.2 Schedule of home visits, e.g. once, throughout pregnancy, postpartum

B.11 Social and Financial Resources

B.11.1 Assist with housing

B.11.2 Referral for social support, counseling, etc.

B.12 Other Referrals

B.12.1 Home health agency

B.12.2 Community mental health center

B.12.3 Safe shelter

Interventions to Reduce Medical Risk

B.13 Treatment of Existing Illness

B.14 Referral or Consultation with Other Specialized Providers

B.14.1 General medical

B.14.2 Dental

B.14.3 Community outreach program, home health agency

B.14.4 Perinatal or obstetric

B.14.5 Community mental health center

B.14.6 Pediatric

B.14.7 Other specialists